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# INDIA
## An Archaeological History
### SECOND EDITION

Palaeolithic Beginnings
to Early Historic Foundations

DILIP K. CHAKRABARTI

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## Palaeolithic Beginnings to Early Historic Foundations

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Dilip K. Chakrabarti

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UNIVERSITY PRESS

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# Preface

The Indian subcontinent has been an area for archaeological research for over 200 years. Since Independence the pace of this research has increased manifold, and despite some major lacunae, we have reached a stage of knowledge where it is possible to offer a connected account of the history of prehistoric and early historic India primarily, if not exclusively, on the basis of archaeology. The present volume aims to do that. It is much more than a compendium of ancient Indian archaeological data, bringing out, as it does, the flow of India's grassroots archaeological history in all its continuities and diversities. Beginning with the first stone tools in the subcontinent, the book weaves its archaeological history in all the areas and multiple strands of development till the early historic foundations. Among other things, it discusses the basic significance of Indian prehistoric studies, the variegated pattern of the beginning of village life in India, the various issues related to the Indus or Harappan civilization and how the transition to, and consolidation of, the early historical India took place.

This was written in the academic year 1997–8 and the formal invitation to do so came from OUP, New Delhi. I would like to thank them for this privilege. Dr Sylvia Lachmann kindly found time to read all its chapters, some of which were also read by Reverend G. Seevalee, Christopher Bayliss and Corinna Bower. My thanks are due to all of them. Dr Nayanjot Lahiri gave me a copy of *Indian Archaeology—A Review,* 1992–93 and helped in other ways.

The 'India' of this book is the Sanskrit *Bharatavarsha,* the subcontinent as a whole. In a major Bengali literary piece—*Aranyak* ('forest-dweller')—the author, Bibhuti Bhusan Bandopadhyay, enters into an imaginary dialogue with Bhanumati, a tribal princess who lived in a forest village called Chakmakitola.

Have you heard the name of Bharatavarsha? Bhanumati nodded to say that she had not heard the name. She had never been out of Chakmakitola. In which direction could one find Bharatavarsha?

If at the end of this book one is left with a sense of the archaeological direction to Bharatavarsha, I shall consider this humble endeavour of mine successful.

This book is dedicated to Mr V.C. Joshi, who played a significant role in the development of archaeological research in the subcontinent in the 1980s. As a consultant of the Ford Foundation, Delhi, he was instrumental in shaping the Foundations' interest in South Asian archaeology. In India this interest led, among other things, to the sanction of major grants to the Indian Society for Prehistoric and Quaternary Studies for its journal *Man and Environment* and the archaeology sections of the Banaras Hindu University, Deccan College, Pune, and M.S. University, Baroda. In Bangladesh, the Foundation initiated the process of establishing archaeology in one of the universities, with Mr Joshi closely working with Bangladeshi colleagues. Those of us who came in contact with him will always remember his kindness and grace and deep commitment to duty.

# I

# Introduction

## Ancient India: The Importance of Archaeological Evidence

There are two good reasons why a historical study of ancient India cannot realize its full potential on the basis of textual sources alone. First, the sources which have been used, beginning with the *Rigveda,* were not meant to be historical sources, and whatever historical information has been gleaned from them is not free from questions regarding their chronology, geographical applicability and even content. Except for the history of the kings of Kashmir, written by Kalhana in the twelfth century, there is no proper historical chronicle dating from the ancient period of Indian history. As H.C. Raychaudhuri wrote: 'No Thucydides or Tacitus has left for posterity a genuine history of Ancient India.'[1] K.A.N. Sastri wrote of 'the utter impossibility of basing any part of the ancient history of India solely, or even primarily, upon literary evidence.'

Not only is there a paucity of professedly historical works, but of very few really ancient compositions do we know with certainty the time and place of origin. Great books which, like the *Ramayana* and the *Mahabharata*, have for ages served as popular encyclopaedias of national culture, were frequently revised; the time, the authorship and the extent of such revisions are so obscure that it is hopeless to make an intelligent use of data drawn from these works. Lastly, in the few works of which we have definite knowledge in regard to authorship and provenance, a great amount of space is taken up by conventional descriptions, and it is seldom that we come across the plain downright statement of a fact.[2]

The problem of sources is not limited to the texts. It affects in good measure inscriptions, coins, sculpture, painting and architecture as well, although in these cases geography and chronology are not among the problems. The number of early inscriptions is severely limited. They increase in number only in the tenth–twelfth centuries, more in the south than in the

rest of the subcontinent. But inscriptions are also textual compositions, and, like other textual compositions, devote a lot of space to conventional descriptions rather than to the enumeration of the event for which the inscription was intended in the first place. Coins come mostly from 'hoards'—accidental, non-contextual discoveries which very often end up with the coin-dealers. A framework of the study of coins has no doubt emerged, but on many occasions the study of ancient Indian coins has not been able to proceed beyond a study of their design. The same is true of the specimens of art and architecture. They are concerned much more with the religious life of the day in different regions and less with the issues of individual authorship and patronage, precisely the issues which would have made them exciting as historical documents.

Over the last two centuries or more, scholars have certainly mapped out the different areas of ancient Indian history, but in many cases this has been no more than a preliminary sketch of the terrain. It is doubtful if they could do any better. When one remembers that there is no fine chronological grouping of the early Buddhist literature and that the whole of it can be put only in a broad period from the sixth to the second century BC, the best the historians of ancient India could do in this regard was to offer a generalized version of 'Buddhist India'. Further, because the geographical perspective of these texts is limited mainly to the middle Ganga plain, this generalized version can apply not to India as a whole but only to the region which it invokes. This situation is true not merely of Buddhist India but virtually of all the epochs and geographical regions that we can think of in the context of ancient India. In fact, behind its academic curtain, there are vast stretches of darkness and too many loose ends. Under the circumstances, the pioneering modern historians of ancient India could only lay the outlines of the subject, moving from epoch to epoch and giving us a general scaffolding which somehow holds together. It could also be only a story of historical development in a more or less single line which, in fact, had the effect of blurring the multiple regional strands of India's historical growth, at least for the early period.

Such basic limitations of the available sources cannot be wished away, nor can the situation improve by rephrasing the historical questions in the language of the social sciences. Whatever cloak a modern historian of ancient India may wear—that of an old-fashioned historian or of a modern social scientist—one cannot shed the burden of proof, and historical proof, as we all know, lies basically in the sources.

Archaeology can greatly expand the nature of the sources in the context of ancient India. Even in the areas with a much larger mass of detailed and rigorous textual documentation, archaeological research often leads to

hitherto unperceived dimensions of the historical landscape. In the case of ancient India, where the basic quantum and the rigour of textual documentation are comparatively limited, archaeological research becomes more than ordinarily significant.

Archaeology can also greatly change the nature of historical questions, and it is here that the second reason of the significance of archaeology in ancient Indian historical research is rooted. Although modern archaeology is not afraid of handling a multitude of issues ranging from environment and subsistence to symbolism and cognition, it is primarily in the reconstruction of the story of man-land relationship through the ages that the subject excels. What we want to emphasize in the context of the ancient history of such a vast land mass as the subcontinent of India is that it is only through the reconstruction of the historical development of man–land interaction in different parts of the subcontinent that the framework of a past acceptable to all segments of its population can emerge.

The past is a hotly contested arena of modern times,[3] and the fact that it has become so is in a large measure due to a sense of monolithic, racist past that we have inherited as a colonial legacy in a large part of the world. In the case of India, one immediately realizes that since the beginning of research on the history of ancient India, the story of its conquest by a carefully constructed 'superior' racial and linguistic group called the Aryans has been an overwhelmingly dominant theme and that this conquest and the subsequent assimilation of the various indigenous strands of culture by the conquering Aryans have been said to constitute the very basis of ancient Indian society and history. Even if this theme and approach are true—and we shall see in a later section that they are not—why should those who are considered beyond the Aryan pale accept this reconstruction of the past as their own?

As far as the Third World countries go, the most pressing need these days—as far as I as a Third World archaeologist understand it—is certainly to go beyond the bagful of colonial theories which they have all inherited and try to build up an image of themselves in which every member of their nation state can participate, irrespective of their regional, caste, tribal, religious, sectarian and a whole host of other affiliations. The primary sector of the past in which such a broad-based participation is possible is the history of their land, that particular patch of the earth's surface which has befallen to their lot as a product of the historical circumstances and through which they have interacted in various ways through time. This approach makes archaeology predominantly a part of the environmental sciences, and as an Indian archaeologist I would state that it is only this approach which can lead to the concept of an Indian past in which all Indians can share.[4]

Thus, if one is interested in a non-sectarian and multilineal image of

ancient India, archaeology, especially aided by the scientific techniques which are now available to the cause of archaeological research, provides the most significant area of historical enquiry.

## THE DEVELOPMENT OF ARCHAEOLOGICAL RESEARCH IN THE SUBCONTINENT[5]

### *Early Notices*

These go back to the early sixteenth century and involve three groups of people—Portuguese residents of Goa, other European sailors and occasional travellers. Principally, two categories of monuments are dealt with during this phase: the rock-cut caves of west India and the south Indian temples. Richly carved examples were generally considered too heathenish to be of appeal to good Christians, but some like the Italian Pietro della Valle, who visited India between 1623 and 1625, did not altogether ignore objective reporting. He himself drew the ground plans of south Indian temples, the first of their kind in European literature. Among the monuments in the interior, Elephanta was frequently described, and in the east the Black and White Pagodas—the Konark and Jagannatha temples of Orissa respectively—were known as early as the seventeenth century when they served as prominent navigational markers on the Orissan coast. By the middle of the eighteenth century, European familiarity with Indian monuments was fairly broad-based.

### *The Middle of the Eighteenth Century*

The formal beginning of Indian archaeology can be traced back to the middle of the eighteenth century, when academic interest in the Indian antiquities began. This interest is best expressed in the writings of the French language scholar, Anquetil du Perron, who is better known for his translation of the Upanis'ads, and the Danish engineer, Carsten Niebuhr, who also reported on the archaeology of Arabia and Persia. Both emphasized the need for a systematic and scholarly study of Indian antiquities. This was also the time when a French geographer, J.B.B. D'Anville, discussed the possible location of the famous site of Pataliputra. To understand this specific geographical interest we have to remember that in classical antiquity, people from the Mediterranean lands were frequent visitors to India and some of them also wrote books on her, which have generally survived only in fragments. The memory of India, thus, was never lost from the European mind. There was also an element of contact between Europe and India possibly throughout the middle ages. The names of the major ancient Indian cities

were known from the classical sources, and by the middle of the eighteenth century there was a specific geographical interest to identify them on the ground. Pataliputra, the ancient Mauryan capital described by the Greek ambassador to the Mauryan court, Megasthenes, was one of these cities. D'Anville incorrectly identified Pataliputra with Prayag at the confluence of the Ganga and Yamuna. However, it is not the correctness of such identifications which matters; what is important is that around the middle of the eighteenth century the old classical references to Indian cities were being remembered and sought to be understood in modern terms. Incidentally, Pataliputra's correct identification with modern Patna had to wait till 1788, when the second edition of an English geographer's book, *Memoir of a Map of Hindustan*, was published. The geographer concerned was James Rennell, who collaborated with J. Tieffenthaler, a German missionary, and du Perron, to produce a three-volume study of Indian historical geography in 1786–88.

We must also realize that in the second half of the eighteenth century there was considerable philosophical interest in the antiquity of India in Europe, especially among the philosophers of the French Enlightenment. In their quest to move away from the dogmas of Biblical tradition, these scholars, who included Voltaire and Diderot, first looked towards China and then towards India as centres of civilization and culture. Voltaire, in fact, went to the extent of asserting that everything had come down from the banks of the Ganges!

### *The Establishment of the Asiatic Society in Calcutta*

The establishment of the Asiatic Society on 15 January 1784 fits into the ethos of the age. This was the period when 'societies' of various kinds were being established and consolidated in Britain. The prospect of British ascendancy in India had also become clear by then, and consequently, from the administrative and economic points of view, there was a great need to know systematically about the country they were to rule. There was a further need to relate India to the contemporary framework of European knowledge of human history. William Jones, the founder of the Asiatic Society, came to India as a judge of the East India Company court in Calcutta after a career as an oriental scholar and poet in England. The founding of this Society did *not* initiate archaeological research in India, as is the common belief, but it acted as a kind of catalyst in that the study of antiquities found an institutional focus among the Europeans in India. Jones was interested in Indian products including plants and timber, the traditional system of Indian jurisprudence and the study of Sanskrit literature. He edited the Society's journal, *Asiatick Researches*, where his

'discourses', before the Society were published between 1788 and 1793. There were ten such 'discourses' which constitute the basic source of his ideas about ancient India.

Jones is credited with the first clear statement about the linguistic affinity between such languages as Sanskrit, Greek and Latin. In this sense he has been credited with the foundation of what later came to be known as the discipline of comparative philology. The truth, however, is more complex. In the late eighteenth century, the Biblical theory of creation was the accepted belief, and if, according to this, various human groups or families descended from Noah's progeny, they had to be mutually related. All that remained for scholars to do was to trace or discover the evidence of such relationships. Jones's main concern was to relate Indian history to Universal History as it was then understood. It was left to Jones to relate the Indian past to the progenies of one of the sons of Noah, 'the just and virtuous man, whose lineage is preserved from the general inundation'. The original centre of dispersal of 'the whole race of man' was thought to be Iran. In his 'discourses', Jones traced the ramifications of this idea in various fields—language and literature, sculpture and architecture, religion and philosophy, etc. His idea that Sanskrit was related to Latin and Greek was formulated in his third 'discourse' delivered on 2 February, 1786, but what is ignored is that in the same sentence he brought in the Peruvians and the Japanese as well. The speakers of Sanskrit were supposed to have 'had an immemorial affinity' with them too. These basic historical and linguistic ideas of Jones were shared by many of his contemporaries or near-contemporaries, although not everybody agreed with him that the centre of dispersal was Iran. Thomas Maurice, for instance, in his seven-volume study of Indian antiquities, went to great lengths to argue that the position of the equator was once further north, resulting in a better climate in central Asia, and that the Brahmins, the original inhabitants of that area, travelled as far west as Scotland, spreading civilization along the way. Maurice proposed many similarities between the Druids of Britain and the Brahmins of India.

Although archaeological discoveries were scanty till the 1830s, certain major publications date from the early part of the century, the most important of them being Francis Buchanan's three-volume report on his Mysore survey in 1807 and his survey of Bengal Presidency, submitted in 1816. A three-volume summary of the latter was published in 1838. These were mainly statistical surveys but contain a fair amount of archaeological information. Another set of report of this period was not published, but its author, Colin Mackenzie, made a beginning of the study of antiquities in south India through his collection of inscriptions and manuscripts.

## *The 1830s*

By the early 1830s, James Prinsep, Assay-master of the East India Company mint in Calcutta, became the Secretary of the Asiatic Society and played a major role in the initiation of field research. His own contribution to Indian studies makes him a legendary character. He was primarily responsible for the decipherment of the two most important historical scripts of India—Brahmi which was current everywhere outside the north-western region, and Kharoshthi, which was prevalent primarily in north-western India. First, the ninth-century eastern Indian inscriptions were read by Charles Wilkins in the late eighteenth century on the basis of his knowledge of medieval manuscripts of the region, and then it became a case of proceeding from the known to the unknown. The process culminated in James Prinsep's reading of the inscriptions of king Asoka of the third century BC between 1834 and 1838. The breakthrough in the decipherment of the Kharoshthi script came in the wake of reading two royal names in Kharoshthi on the coins of two Indo-Greek kings, Agathocles and Pantaleon (*c.* 1st century BC–*c.* 1st century AD), whose names in Greek also figured in them.

With the decipherment of these two ancient scripts rapid progress was made in the fields of epigraphical and numismatic studies. This, in turn, led to a proper understanding of the chronology of historical sites. This was also the time when attempts were made to understand Buddhist legends on the basis of the two Sri Lankan chronicles—the *Dipavamsa* and the *Mahavamsa.* An important result was the discovery of the name *Piyadasi* or Asoka in these Buddhist chronicles.

The Buddhist *stupas*, especially those in the north-west, came in for attention during this period, and the process gained momentum after two European generals employed in the Sikh army excavated the Manikyala stupa in Punjab near present-day Rawalpindi. Lieutenant Alexander Burnes and Charles Masson were among the major discoverers of stupas, Indo-Greek coins and sculptures in the north-western part of the subcontinent and Afghanistan. Military men on active duty in these areas generally amused themselves by getting ancient sites dug up by their soldiers and acquiring the so-called Grecian remains. Certain settlement sites in north India were studied and reports on miscellaneous antiquities began to increase in number. For instance, in his four days at Kurkihar near Gaya in Bihar, Markham Kittoe dug up and collected ten cart-loads of Buddhist idols. Another interesting feature of this period was the excavation of megaliths in south India, and 'barrow-hunting' was, in fact, a pleasant pastime for European officers in the cool of the Nilgiris. At Jiwarji, a

megalithic site in the Deccan, Captain Meadows Taylor published his excavation results with sections, which was certainly exceptional for his time.

### *Alexander Cunningham and His Successors till 1902*

Meanwhile, a young military engineer, Alexander Cunningham, who came to India at the age of 18 and rose to the rank of Major-General, was deeply inspired by Prinsep and took off on his own, deciding to go beyond individual sites and areas. There were two major Chinese pilgrims in India: Faxian (Fa-Hien) in the fourth–fifth century and Xuanzang (Hiuen-Tsang) in the seventh century. The latter's itinerary is much more detailed. Entering the subcontinent through the north-west, he travelled extensively and wrote detailed descriptions of the areas he visited and their distances and directions from each other. The accounts of these two Chinese pilgrims were translated into French and published in the 1830s. Cunningham realized the great significance of these accounts in fixing the locations of major archaeological sites. If only one followed the footsteps of these pilgrims, it would be possible to identify archaeologically the places mentioned by them. It may be noted that Cunningham did not depend exclusively on the Chinese pilgrims; in the north-west, he copiously cited the accounts of the classical writers who also figured in his discussions elsewhere.

By the 1840s, Cunningham formulated his methodology; in 1843 he identified the ancient site of Sankisa, and in 1848 he offered a scheme of archaeological investigations to the Government of India. He argued that this would be

> an undertaking of vast importance to the Indian government politically, and to the British public religiously. To the first body it would show that India had generally been divided into numerous petty chiefships, which had invariably been the case upon every successful invasion; while, whenever she had been under one ruler, she had always repelled foreign conquest with determined resolution. To the other body it would show that Brahmanism, instead of being an unchanged and unchangeable religion which had subsisted for ages, was of comparatively modern origin, and had been constantly receiving additions and alterations; facts which prove that the establishment of the Christian religion in India must ultimately succeed.[6]

It took a long time for this scheme to be implemented, but eventually in 1861 the Archaeological Survey of India came into a tentative existence with Alexander Cunningham as its head. He was provided with a budget, an exploratory staff of draftsmen, etc. and the services of three (two, to begin with) assistants—J.D. Beglar, A.C.L. Carlleyle and H.W. Garrick. With a gap between 1866 and 1870, when the Government of India

discontinued the work of the Survey, Cunningham continued his work till 1885. The results of his and his assistants' surveys were incorporated in a series of volumes which still constitute essential reading for anybody interested in Indian archaeology. Cunningham had the specific target of reconstructing the ancient historical geography of India by peopling it with actual sites and monuments. It was a grand exercise in topographical archaeology. He did not undertake detailed excavations except occasional clearance work and deep trenches. It must be emphasized that his work did for Indian archaeology what the great Trigonometrical Survey of India did for the land mass, i.e. gave it its features and bearings. His personal scholarship can only be marvelled at; he could write authoritatively on anything from ancient architecture to medieval coins. He was criticized by some of his contemporaries on various grounds, which in retrospect sound generally malicious and invariably trivial. From the Bengal marshes to the arid hills of the North-West Frontier Province—he was everywhere, going around, mostly on horse, elephant and in palanquin. The dust of the Indian countryside hangs low over the pages of the reports written by him and his assistants; theirs was not an India seen through the unreal world of dry-as-dust manuscripts.

As often happens with people with towering obsessions, they have very poor opinion of the ability of their successors. So, before he retired from the Archaeological Survey of India, Cunningham recommended the discontinuation of a centrally organized 'Survey'. Consequently, the responsibility fell on the shoulders of the provincial governments, who employed a number of regional surveyors. Their work was coordinated by James Burgess, who was interested only in architectural surveys. His monographs on the monuments of west and south-east India are monuments to his pioneering endeavour in this regard. In this field of study he was joined by James Fergusson, an indigo planter who was interested in working out a typological sequence of Indian monuments, principally temples, and his history of Indian architecture is an important contribution to this field. It was during this period that a separate epigraphist was employed for the editing of ancient Indian inscriptions. As the volumes of *Corpus Inscriptionum Indicarum* and the subsequent *Epigraphia Indica* indicate, the creation of this post had far-reaching academic results. Among the few major field-archaeological discoveries of this period one may mention the excavations at Kankali Tila in Mathura, the explorations in the Nepalese terai and the identification of various topographical features of ancient Pataliputra. The work at Pataliputra was done not by any government archaeologist but by an officer of the Indian Medical Service, L.A. Waddell.

### *The Role of Indians in Indian Archaeological Studies till the Close of the Nineteenth Century*

It is not generally remembered that virtually all early western scholar-administrators in India had their native 'pundits', i.e. the traditional scholars of the land. It was through their expertise in diverse branches of Indian learning that western scholars could relate them to the framework of western knowledge. However, regular antiquarian research in the western sense had to wait for a general dissemination of western ideas which, in turn, could not properly take place before an effective system of English education was introduced in 1835. In the second half of the nineteenth century, several Indians became prominent in the field of Indology: Babu Rajendra Lala Mitra who undertook the editing of Sanskrit manuscripts on behalf of the Asiatic Society, published articles on inscriptions and subsequently researched the antiquities of Orissa and the ruins of Bodh Gaya under government patronage; Ram Raz, a 'native' judge of Tanjore, who wrote a manual on the principles of Indian architecture around the middle of the nineteenth century; Bhau Daji of western India, who principally published inscriptions from that region; R.G. Bhandarkar, who wrote on the antiquity of sites like Sopara and Kolhapur, both in Maharashtra; and P. Mukherji, who explored the Nepalese terai and published a report on it towards the end of the century. This is an area where virtually no modern research has been undertaken; especially rewarding would be an attempt to find out how the gradually emerging sense of the ancient Indian past affected the consciousness of the English-educated Indian élite in different parts of the country.

### *Some Operative Forces in the Study of Ancient India*

At this point we must draw attention to the fact that the sense of the Indian past in the nineteenth century and later was conditioned not so much by archaeological discoveries, including those of inscriptions and coins, but by textual scholarship. Quite logically, the language studies were in the forefront of the needs of the East India Company administration. A detailed textual scholarship was needed to have access to, and to understand, the principles of Hindu religion, philosophy, jurisprudence, etc. which, in turn, would make the colonial administration appear more acceptable and less interfering in the eyes of the vast majority of its subjects. However, in addition to the needs of administration, three extraneous factors came to be closely associated with the development of Indology and had effects over the acceptance and expansion of the discipline in the academia. The first was the close association of the Romantic Movement in early nineteenth-

century Germany with the comparative study of languages and the reconstruction, on that basis, of a master, unsullied race.

Contemporary German nationalism often imagined such a master race at the roots of the Germanic identity. Around this time this master race was given a name too—the Aryans. This intellectual development greatly furthered the cause of comparative philological studies in the universities of Europe. In this scheme the study of Sanskrit figured prominently. The second factor was the concept of race and its amalgamation with both language and culture. If one compares the methodology of racial classifications done in the late eighteenth century with that undertaken in the 1960s and 1970s, one realizes that throughout this period there have certainly been elaborations of various racial classificatory systems but the basic methodology and its linguistic and cultural overtones have remained unchanged. Also, despite occasional protestations to the contrary, each of these classificatory systems is value-laden in the sense that it has a built-in belief in a superior/inferior hierarchy of races. Some tentative ideas about Indian 'races' were aired in the second half of the nineteenth century, but towards the end of the century a systematic racial classification of Indian people was in place, with the Aryans at the top of the postulated hierarchy. Virtually all the major groups, including the Aryans, were interpreted as having come from outside. The early corpus of Sanskrit literature was also the earliest extant record of the Aryan literature, and from this point of view, it is hardly a matter of surprise that the German Romantics would be enamoured of the beauties of Indian literature and philosophy. The third major ingredient of Indology of this period was a carefully constructed dichotomy between ancient India and the modern India and Indians. By the time the British came as rulers, the ancient Aryan civilization of India was degraded, and its rejuvenation could take place only under the British rule which in fact was a modern Aryan rule, because linguistically and racially the Anglo-Saxons were placed within the pristine Aryan fold.

In one sense this offered a kind of legitimacy to the British rule and European dominance in general, and the premise could also satisfy the Indian upper castes because through their ancient Aryan affiliation they could claim cousinship with their rulers. The German Romantic concern with the ancient Sanskrit literature and philosophy has had the effect of partly hiding the belief that all major changes in Indian culture and society could come to India only from outside. This model of the study of the ancient Indian past replicates the approach to the study of the past of Black Africa during this period when the black Africans themselves were dubbed as mere passive recipients of various impulses coming from outside their geographical domain. It is now an acknowledged part of modern historical

scholarship that various socio-political issues affect the way in which the past is reconstructed at a given point of time. In this context, it is important to try to understand the basic forces and attitudes shaping the study of ancient India. This issue is doubly significant in the context of Indian archaeology because as long as the old sense of the ancient Indian past prevails, the archaeological approach to the history of the Indian land is unlikely to make much impact.

### *Indian Prehistoric Studies till the End of the Nineteenth Century*

Some earlier discoveries notwithstanding, the most important milestone in this field was achieved by a geologist of the Geological Survey of India, Robert Bruce Foote, who discovered a handaxe belonging to the lower palaeolithic stage in a gravel pit at Pallavaram near Madras in 1863, four years later than the acceptance of the prehistoric antiquity of man by the Royal Society of England. This discovery inspired geologists working in other parts of India, and soon they were reporting palaeolithic and other types of prehistoric tools and their contexts from those areas. Foote himself went on making discoveries in Andhra, Tamil Nadu, Karnataka and Gujarat. Eventually, his collection came to be housed in the Government Museum in Madras, and the two volumes of catalogue of this collection, which were published posthumously under his authorship in 1914 and 1916, gave the study of Indian prehistory a clearly visible shape. The association between the palaeoliths and the Pleistocene extinct fauna in India was also established in the second half of the nineteenth century by geologists. Further, by the end of the nineteenth century they highlighted the occurrence of various types of rocks and minerals used by prehistoric Indians. It was during this period again that an archaeologist, A.C.L. Carlleyle, an assistant of Alexander Cunningham, discovered mesolithic remains not merely in the Kaimur hills section of Uttar Pradesh but also on the bank of the Ganga between Ghazipur and Banaras.

### *Indian Archaeology at the Turn of the Twentieth Century and the Impact of Lord Curzon*

From the beginning of notices in the early sixteenth century to the closing years of the nineteenth century, the tentative footsteps of Indian archaeology can easily be traced, its dominant theoretical frame of field-enquiry being a concern with the issue of ancient Indian historical geography. Sites, inscriptions, coins, sculpture, architecture—all had their place in this overriding scheme. At the dawn of the twentieth century there was a definite archaeological shape of India's ancient past. However, this achievement should not detract us from a number of important considerations. First, the

government's role in this was both brief and limited. The Archaeological Survey of India was organized as late as 1861 and suffered at least two major interruptions before the end of the century, first between 1866 and 1870, and then again for a longer period after Burgess's retirement in 1889 when, although provincial surveyors like H.T. Cousens did a fair amount of work, there was no central archaeological leadership. Second, in the important task of preserving the Indian monuments there were only brief and generally half-hearted attempts. The special post of a Curator of Ancient Monuments was no doubt created in 1880, but that lasted only for three years, after which the responsibility of conservation passed on to the provincial governments who, in turn, passed it on to their Public Works departments. Third, there was no policy of systematically excavating ancient historic settlements. Whatever excavations had taken place were haphazardly done and were only of marginal significance. In fact, in the closing years of the nineteenth century the government had no bigger plan for archaeology except a province-wise listing of the major monuments and sites.

The viceroyalty of George Nathaniel Curzon is significant in the growth of archaeology as a subject in the subcontinent. It has been pointed out that after the Boer War there was a crisis of confidence in the Empire, which led to the notion of its 'civilizing mission' in the controlled territories. Further, in Britain this was also the period of the first major Conservation Movement. It is probable that the new viceroy's attitude was to some extent shaped by these developments. What he planned for and achieved was a centralized government direction for archaeology in India in each of its hitherto recognized branches—conservation, exploration, excavation and epigraphy.

> All are ordered parts of any scientific scheme of antiquarian work. I am not one of those who think that Government can afford to patronize the one and ignore the other. It is, in my judgement, equally our duty to dig and discover, to classify, reproduce and describe, to copy and decipher and to cherish and conserve.[7]

In retrospect, another decision of the viceroy was highly significant. He consistently opposed the attempts of western 'oriental scholars' to take over the reins of Indian archaeology. This manifested itself, first, in his rejection of the idea of establishing an International Association for Archaeological Research in India and an Indian Exploration Fund. Second, while laying down the qualifications of the proposed post of a new Director-General of a freshly organized Archaeological Survey he did not consider oriental scholarship essential. The racist dictates of colonial Indology did not apparently cut much ice with the viceroy.

For years the necessities of Indian Archaeology have fallen into the hands of philologists who have made a preserve in pressing home the exploded theories of Professor Max Müller, largely responsible for the exaggerations of Western Civilization.[8]

Eventually, John Hubert Marshall, possessor of a First Class Classical Tripos and a First Class Archaeological Tripos Pt II at Cambridge, was given preference over the claims of Vincent Smith who was by then a senior member of the Indian Civil Service and had written on the history of Indian art with an unshakeable belief in its inferiority to western art. The formal offer of the post was made to Marshall on 20 November 1901 and he arrived in India in February 1902.

### *The John Marshall Era in Indian Archaeology, 1902–44*

Marshall retired from his post in 1928, and there were four Directors-General—H. Hargreaves (1928–31), D.R. Sahni (1931–35), J.F. Blackiston (1935–37) and K.N. Dikshit (1937–44)—before Mortimer Wheeler came in 1944. However, the period 1902–44 was the Marshall era in the fullest sense of the term, and in many ways the tradition set by him still persists. The administrative history of the Survey does not concern us here; all that can be noted is that by 1906 the Survey was put on a permanent footing by the government and along with it came the basic still-continuing administrative shape of the Survey, i.e. its division into a number of 'branches' and 'circles' with the Director-General's office at the top. The basic principles of the conservation policy of the Survey were laid down by Marshall in a manual first issued in 1907. A highlight of this policy was that the originality of the structure to be preserved had to be kept as closely unchanged as possible. Moreover, there was a steady emphasis on the tasks of exploration and excavation in different parts of India, undertaken not merely by him but also by his officers. In fact, it was his officers who played an increasing role in the field-work, with his own role being principally confined to the three cities of Taxila, which he dug assiduously from 1913 onwards. The emphasis was on the excavation of the principal early historical cities of north India and the associated stupa and monastic sites, with Marshall himself leading the way at Rajagriha (1905–6) and Bhita (1911–12). For the first time, the early historic urban past of north India was being given a touch of reality by the archaeologist's spade. Marshall's own major work at the religious site of Sanchi still remains a work of grandeur. Another major achievement of his time was the discovery of the Indus civilization. The principal sites of this civilization excavated during this period are Mohenjodaro and Harappa, the first subjected to excavations by R.D. Banerji in 1922, and the second a year earlier by D.R. Sahni. Both sites had been

known for a long time but their archaeological significance was not appreciated till these excavations were undertaken. The site of Harappa was much destroyed by the depredations of the railway contractors of the Lahore–Multan railway, and thus Mohenjodaro became the major focus of horizontal excavations, the first phase of which culminated in a publication edited by Marshall himself, who also wrote some of the core chapters. His assessment of this civilization and observations on some of its crucial aspects, as revealed in the monumental *Mohenjodaro and the Indus Civilization*, have stood the test of time. The implications of the discovery of the Indus civilization in the archaeology of the subcontinent were fully understood by him, with several exploration programmes in this regard being initiated soon after (cf. Aurel Stein's explorations in north and south Baluchistan). On a different plane, Aurel Stein's discovery of buried Buddhist ruins in the deserts of central Asia in 1900–1, 1906–8 and 1913–16 was made on behalf of the government of India, and for the last two spells Marshall's Archaeological Survey of India can certainly claim some credit. However, Stein's early work in Central Asia was more as an arm of the British diplomacy in that region and less as an Archaeological Survey of India operation, and his loot of the Buddhist antiquities and manuscripts from such places as Dun Huang serves as a good illustration of the kind of archaeological brigandage which used to be once conducted with the blessings of the strong western nations.

A great strength of Indian archaeology under John Marshall was the initiation of a new publication series, *Annual Reports*, incorporating the Survey's work from 1902 onwards. The series continued till 1935–36. Specialized themes were treated by different *Memoirs*.

The post-Marshall years till 1944 certainly saw some good work done, notably at the Indus civilization sites of Mohenjodaro, Chanhudaro and Harappa and at the early historic site of Ahichchhatra, but otherwise this period is marked by severe economic cuts and the consequent stagnation of the Survey's activities. The government of India took a renewed interest in the Archaeological Survey by inviting in 1938 a British Mesopotamia specialist, Leonard Woolley, to report on it. He came down rather heavily (without any serious justification) on the standard of excavations practised by the Survey since John Marshall's time and recommended the appointment of a new Director-General from outside the Survey. This led to the appointment of Mortimer Wheeler as the Director-General for the period 1944–48.

### *Mortimer Wheeler and the Archaeological Survey, 1944–48*

Wheeler was strident in his condemnation of the lack of stratigraphic

methods of excavation under John Marshall and his successors. He overlooked the simple fact that by their emphasis on the total excavation of a site, floor-level by floor-level, they could certainly have been careless about the succession of some (not all) structures and objects, but at the same time they were successful in offering a kind of total image of the characteristrics of a site, which in fact was necessary to impart an archaeological reality to India's ancient past. The hard truth is: various scientific protestations notwithstanding, it is still Mohenjodaro which stands out as the epitome of a major city of the Indus civilization. Many of the later 'scientific' excavations, including Wheeler's own excavations at Mohenjodaro in 1950, remain unpublished in detail. A good number of them were also not conducted widely enough to yield anything except stratigraphy. Indian archaeologists were introduced to Wheeler's methods at a training school which the Archaeological Survey of India set up at Taxila and at his excavations at Harappa, Arikamedu and Brahmagiri. The principles of stratigraphy were rigorously emphasized in these excavations, which were soon duly published in a new Survey publication titled *Ancient India*. More than this, however, archaeology was emphasized both as an academic subject and a craft. As an academic subject it had to be problem-oriented and based far more widely than the confines of a government department, and as a craft its practitioners had to be familiar not merely with the succession of layers and structures but also with a whole range of practical details, down to the successful running of an excavation camp. Wheeler's clarion call to take the subject to the universities and enrich it by a wide application of natural–scientific techniques played a role in the development of the subject after Independence. His creation of a new and separate branch for prehistoric studies in the Archaeological Survey also highlighted his concern for an uninterrupted archaeological history of India covering all phases of human development. Wheeler no doubt paved the path to modernity in Indian archaeology.

## *Archaeology in Post-Independence India*

Despite the achievement of archaeology in British India, there is no denying that in the total scheme of historical investigations archaeology was only a marginal, vocational activity undertaken by a government department. It is difficult to attach even this amount of significance to archaeology in India before the advent of John Marshall, i.e. before 1902. The twenty-three volumes of Cunningham's reports and many other miscellaneous monographs on architectural remains, the editing of inscriptions, etc. need not blind us to the fact that archaeology was a pursuit followed by a few enlightened members of the ruling class and that the

government was mostly unwilling to offer support even to this limited endeavour.

What fundamentally changed in the post-Independence period was the scale of government support to widen the base of archaeological research in the country. The basic shape of the central Archaeological Survey remains the same, but in scale there can be no comparison between the official strength of the pre-1947 Survey and that of post-1947 India. In terms of approved manpower, budget and the number of its 'circles' and 'branches', the modern Indian 'Survey' is truly an archaeological juggernaut. On a different level, the state governments have assumed the responsibility of archaeological research and conservation within their own territories, thus sharing a substantive amount of archaeological power with the central government. On another level, the Indian University Grants Commission has injected large amounts of money into the university system to establish units of archaeological research in different parts of the country. The number of archaeological museums and miscellaneous organizations interested in archaeology has also increased manifold.

Compared to the pre-1947 scenario, the result of all these efforts has been spectacular. The prehistoric and protohistoric roots of every part of the country have now been put in sharp focus. In the historical field too there has been a sharp increase in the quantity of both explored and excavated data. As far as the natural–scientific techniques are concerned, a beginning has been made in most of the major fields. The questions which are being asked of the archaeological data are also manifold and refute the allegation aired in some quarters that theoretically Indian archaeology has not moved forward after Wheeler. Archaeology in Indian universities has been traditionally built around history departments, and in a country with a rich past such as India archaeology is considered quite logically a historical discipline. Other disciplines like anthropology, geology and geography can certainly have archaeological components just as the hard-core natural science subjects like physics and chemistry can play major roles in archaeological dating and analytical techniques. However, because of certain constraints of the Indian university system these multidisciplinary aspects are yet to make a systematic headway. But to argue that archaeology in India has only to be anthropologically structured and not historically oriented is unacceptable.

If Indian archaeology has significantly progressed since Independence, it has also made us aware of the manifold issues and problems (both organizational and academic) associated with it. The area-wise uncertainties of knowledge and the inadequacy of research will emerge in the course of our

discussion in the later chapters. Here we shall only outline the two fundamental issues which continue to obstruct the progress of the subject as a whole in India. The first is related to the traditional Indological framework of ancient India in terms of race, language and culture. If one believes in the inevitability of this framework, one has also to believe in the archaeological inevitability of the Aryans, Dravidians, etc. If one considers, for instance, the Aryans to be a real group of people, one also believes in the geographical and chronological coherence of the Vedic texts. And if one accepts these texts as historical sources indicating a chronology-bound and geography-bound 'Vedic Age', one has also to think of such issues as Vedic archaeology and Aryan archaeology. Many scholars continue to do so, forgetting that archaeology by itself can lead to the reconstruction of grassroots history and that a racial approach (the term 'race' being somewhat unpopular in modern times, some scholars have taken recourse to terms like 'ethnicity' and 'ethnic groups') should not, methodologically, be a part of it. They tend to ignore, either deliberately or through ignorance, the vicious socio-politics of the racial approach to the past. Although strong voices have been raised in recent years against this approach, this has not gone out of scene in archaeological literature either in India or abroad. As long as this antiquated and overtly racist approach to the past persists, which it does in the framework of traditional Indology, archaeological emphasis on the grassroots history of the land is unlikely to be appreciated. It is this mind-set which provides the greatest stumbling block to the progress of archaeological research in India as a full-fledged academic discipline.

The second major issue offsetting the progress of archaeological research in India is rooted in the way archaeology developed in the country. It got systematized only as a government activity and even now, to a very large extent, it is dominated by provincial and central bodies. A strong bureaucratic and authoritarian element runs through the organization and execution of archaeological research in India, and in this sense archaeology in India is not a free academic subject like other subjects taught in the universities. Besides, Indian archaeological bureaucracy has been unable to take stock of the changing dimensions of archaeology as an academic subject and orient its planning accordingly. What is perhaps worse is that it has not yet woken up to the sheer scale of destruction of archaeological sites of all kinds due to the ever-mounting population pressure. Further, in an authoritarian bureaucratic structure of management a lot depends on the quality and commitment of the people in higher echelons of the structure. The progress achieved by Indian archaeology in the post-Independence period, especially in its first twenty-five years, was possible because of the

presence of some who had the necessary education and mental frame to look beyond their personal interests and the interests of their caste-groups and regions and focus on the evolution of a national archaeological policy even within the bureaucratic constraints. That policy now lies in tatters, in an increasingly politicized and factious world of higher education and bureaucracy. The only sign of hope is a heightened awareness of archaeology as an academic discipline among the general educated class of the country.

## Aims and Structure

The basic aim of the present volume is to offer an archaeological history of the Indian subcontinent from prehistory to the early historical stage. A purely archaeological history of a given landscape or a region is considered important even in countries like Greece and Italy where the richness of the textual sources is infinitely more detailed and specific than available for ancient India. In the vastness of the Indian subcontinent, where the archaeological and biogeographical ingredients of a landscape-based history are still minimal, a broad sweep of its archaeological past covering all its regions may be an important exercise to demonstrate what archaeology has to offer beyond the narrow parameters of texts. The main focus of such exercises should be a clear assessment of the available knowledge at every step, and flowing through it all and integrating its different components and phases will be a perspective of the long-term settlement history of the land in its multiple strands of development. The land will always flit in and out of the archaeological narrative of the present volume. A Maori proverb says that land is a mother which never dies. *Dharitri* or the earth is a mother in the Indian tradition too.

The structure of the narrative is simple. We introduce the land mass and some of the major geographical parameters and concepts affecting the study of its archaeology and ancient history. Although the palaeolithic sequence is rich in its regional details, the focus is not on the typological and stratigraphic successions of different areas but on what is known about it in absolute historical terms. The same is more or less true of the mesolithic situation, but here the cultural data are more detailed and the continuity of tradition more marked. The transition to food-production is an important post-mesolithic issue, and while underlining the probable existence of the multiple lines of the beginning of this tradition in the subcontinent, we focus on the growth of the wheat–barley–cattle–sheep–goat farming tradition in the north-west and discuss how this led to the Indus civilization. The archaeological issues related to this civilization will be closely exa-

mined. At the next stage our attention will be focused on the growth of agricultural settlements beyond the distribution area of the Indus civilization, and we shall argue that it was the interaction between this civilization, and the advanced hunter-gatherers and the marginal agricultural producers in the rest of the subcontinent, which led to the formation of an agricultural base in all the major agricultural areas and laid down the basis of the subsequent early historic urban growth in the Ganga plains and elsewhere. The archaeological dimensions of early historic India will be considered, although not in detail but with reference to some of their salient features and the totality of the relevant assemblage. Finally, it may be worthwhile to take stock of some general issues regarding our exclusively archaeological history of the land.

## The Land Mass

### *Geographical Preliminaries*[9]

The Indian land mass forms a well-defined geographical entity between 8°N and 36°N latitudes—between the southernmost point of Cape Comorin and the height of K-2 peak of the Karakorams in the north. Taking the areas of Pakistan, India, Nepal, Bangladesh and Bhutan together, it is an area of about 4.4 million sq km, which is only slightly less than the 4.72 million sq km area of Europe excluding the former USSR. Its combined population is well above one billion. 'India' is derived from the Greek 'Indos', itself derived from the Sanskrit 'Sindhu' denoting the Indus river. The Sanskrit 'Sindhu' also led to the Persian 'Hind' and 'Hindustan'. The ancient Indians' name for this land mass is Bharatavarsha, the land where the progenies of the mythical king Bharata live. The Vishnupurana, a text presumably set down in the fourth century, defines its boundaries as between 'Himavat' or Himalaya mountain in the north and the sea in the south. *Jambudvipa* is another major Sanskrit term to denote this land mass.

The geographical elements of the subcontinent are within the confines of its three geomorphological components—the Extra-peninsular Mountain System which runs from the hills of Baluchistan in the west to the Patkoi range and the Arakan Yomas in the north-east and east; the Indo-Gangetic Alluvial Plain which runs up from the Indus delta in Sind to the Brahmaputra valley in Assam, covering the entire sweep of the Ganga plain; and the Peninsula which covers the area to the south of the Indo-Gangetic Plain. The Himalayan mountain-building system is still active, beginning some time in the geologically young Tertiary period. The Indo-Gangetic Alluvial Plain is the result of the deposition of mountain-building debris in

trough-like formations, whereas the Peninsula represents an ancient and stable block of the earth's crust.

The baseline of Indian geology is provided by the Archaean deposits in the Peninsular block, which include two groups of successive formations—the granites and gneisses, and the Dharwar and Aravalli formations. These two groups are known as 'early pre-Cambrian'. The next in the series is the group formed by the Cuddapah rocks and Delhi Quartzites, both dubbed 'younger pre-Cambrian'. The Cuddapah rocks are found principally in Madhya Pradesh and Andhra Pradesh, whereas the Delhi Quartzites form the core of the Aravalli system. The Vindhyan rocks from the Cambrian to the Ordovician period overlie the Cuddapahs in Madhya Pradesh and have the Vindhyan range as their most impressive outcrop. The Gondwana group with its three divisions—Lower, Middle and Upper—ranges from the Permian and Carboniferous to the Triassic and Jurassic periods. The Gondwana deposits, which are in the form of some sandstones and some shales and clays, are preserved in the troughs along the drainage lines of the Godavari, Mahanadi and Damodar rivers and associated with coal seams, sometimes of great thickness. In Kutch, Kathiawar and the south-east coast there are patches of Jurassic, Cretaceous and Tertiary rocks, suggesting only marginal marine transgressions. During the late-Cretaceous and early-Tertiary epochs there were tremendous eruptions of lava flow in a large portion of the Peninsula, building up a great thickness of basalt deposit and covering about half a million or more square kilometres with their distinctive terrain. This is known as the Deccan lava formation. The coastal alluvium and the alluvium of the Narmada and Tapti basins constitute the youngest geological stage in the Peninsula.

In the Extra-peninsular Mountain System the outer Himalayan belt is generally of Mesozoic-Tertiary age. The main Himalayas incorporate rocks of all ages. The Indo-Gangetic Alluvial Plain and numerous other small lowland areas form the youngest element in the subcontinent's structure and include fluvial deposits laid down at various points in the Pleistocene and Recent periods. The outermost chain of the subcontinental hills and mountains is provided by the Karakoram and the Hindukush. To the south of the Karakoram lie the Ladakh and Zaskar ranges. The north-eastern segment of Baluchistan is framed between the Toba Kakar in the north and the Suleimans in the south. The rest of Baluchistan is separated from the Indus plain by the Kirthars and from the Seistan segment of Afghanistan by the Chagai hills. The Makran coastal range separates this coast from the interior. The Safed Koh and other ranges of the North-West Frontier Province (NWFP) are associated with the Hindukush. The Himalayas,

which separate the subcontinent from the Tibetan plateau, lie to the south of the Indus furrow and may be divided into the Main, Lesser and Outer Himalayas, or into Western, Central and Eastern segments. The Outer Himalayas are known as the Siwaliks. The Pir Panjal and Dhauladhar ranges in the Western Himalayas belong to the Lesser Himalayas. The parallel elements are more compact in the Central Himalayas, which fall between Himachal Pradesh and eastern Nepal. In the Eastern Himalayas between eastern Nepal and Arunachal Pradesh, the Siwaliks form only a minor element. A number of ranges belonging to the same phase of mountain-building activity or orogeny separate the eastern frontier from Myanmar (formerly Burma)—the lines of the Patkai range and the Arakan Yomas. Inside the subcontinent the Salt Range separates the Potwar plateau from the Punjab Plains. The Aravallis run from Delhi to the Gulf of Cambay. The Vindhyas, and the Satpuras which lie to the south of the Vindhyas, form a kind of divide across the central part. From Orissa downward the coast is flanked by the Eastern Ghats, and from Bombay to Karnataka the Western Ghats separate the coastal Konkan tract from the interior. The Nilgiris and a few other ranges form a knot of hills in the otherwise coastal tract of Tamil Nadu. Outside the major alluvial stretches, the hills always loom in the horizon in the subcontinent.

Among the river systems, the Indus system, which comprises the Indus and its five tributaries—the Jhelum, Chenab, Ravi, Beas and Sutlej—dominates the area between the NWFP in Pakistan and Punjab–Haryana in India. The length of the Indus is about 2900 km. It retains the character of a gorge-enclosed river till Kalabagh below Attock at the border of the NWFP and Pakistani Punjab. The Jhelum flows through Kashmir before coming down to Punjab. The Jhelum and the Chenab unite and their combined flow meets the Ravi. The Beas flows into the Sutlej which flows for about 1450 km before joining the Indus. Near the NWFP the Indus tributaries include the Kabul, Gomal and Kohat rivers. To the east of the Sutlej lies the dried-up drainage system of the Ghaggar–Hakra which used to join the Indus before falling combinedly into the Rann of Kutch. Further east is the Yamuna which joins the Ganga near Allahabad. The total length of the Ganga is about 2500 km. Apart from the Yamuna, its major tributaries are the Ghaghra or Sarayu, Gandak, Kosi and Son. South of the Rajmahal hills in the east the Ganga develops two channels—the Bhagirathi–Hooghly which flows almost straight south and the Padma which turns east into Bangladesh. There it is first joined by the Brahmaputra, and further east the combined flow is joined by the Meghna, which brings down a large part of the drainage of eastern Assam through the Surma and the Kushiara rivers. The Brahmaputra originates in the Tibetan

plateau, where it is known as the Tsangpo; it enters the Indian territory as Dihong near Sadiya. In the east it is joined by the Lohit and comes to be known as the Brahmaputra. The major rivers in the east coast are the Suvarnarekha, Mahanadi, Godavari, Krishna and Kaveri, which have built up their own deltas—in Orissa (the Mahanadi-Baitarini delta), Andhra (the Godavari-Krishna delta) and Tamil Nadu (the Kaveri delta). The Narmada and the Tapti are the major rivers in Madhya Pradesh, joining the sea through the mainland Gujarat coast. The Banas, Chambal and Luni are the major rivers of Rajasthan. In Gujarat the Sabarmati is an important river. The Bhima and the Tungabhadra are the major tributaries of the Krishna river. The southernmost rivers are the Vaigai, Tamraparni and the Periyar.

The Himalayan wall cuts off the subcontinent from the northern winds, although areas such as Baluchistan are not entirely immune from it. However, the most important climatic factor here is the monsoon. The great air currents over the Indian Ocean in winter and summer are called, respectively, the north-east and south-west monsoons. The north-east monsoon is by and large ineffective, and the winter rainfall in south India is said to be caused by the retreating south-west monsoon. The pattern of rainfall in India is determined by the south-west monsoon between June and September. The date of its onset varies from region to region. Its arrival in Calcutta, for instance, is earlier than its arrival in Delhi. There is a great variability in the distribution of annual rainfall in India, just as there is considerable variability in both summer and winter temperatures and the associated humidity.

The traditional scheme of Indian soils recognizes alluvial soil, black cotton soil of the Deccan Lavas, red soils and lateritic soils. Each type possesses numerous variations.

Four vegetation divisions are identifiable on the basis of annual rainfall: over 203.2 cm or 80 inches—evergreen forests; 101.6–203.2 cm—deciduous forests; 50.8–101.6 cm—drier deciduous forests grading into open, thorny scrub; under 50.8 cm—thorny scrub and low open bush merging into semi-desert. The subcontinental wild life, which used to be singularly abundant, now survives or seeks to survive only in the sanctuaries set up in different parts of India. The issue of regions can only be briefly considered here. A rigid definition of regions being impossible, various scholars have proposed various schemes of physiographic classifications for the subcontinent. O.H.K. Spate, for instance, proposed 35 first-order regions, 75 second-order regions and 225 third-order regions. The details of such regions may be considered, when necessary, in specific archaeological contexts. It would suffice for the present to note that the major areas are broadly Baluchistan, NWFP, Kashmir, Ladakh, Sind, Punjab, Indo-Gange-

tic Divide, Ganga valley, Assam, Rajasthan, Gujarat, Maharashtra, Karnataka, Kerala, Tamil Nadu, Andhra, Orissa, Madhya Pradesh, and the mountainous and hilly areas of the north-east.

## *Geographical Issues*[10]

### *India in Relation to the Rest of Asia and Africa*

India is certainly isolated from the rest of Asia by a mountain rim extending from the north-western corner of Baluchistan in the north-west to the Chittagong coast in the extreme south-east. In a number of ways, especially in the area of climate, this isolation has offered India a distinct identity. At the same time, India's isolation from the rest of Asia need not be overemphasized. This isolation simply means that the modern territorial units of the subcontinent were not always buffeted by winds blowing across from beyond the northern borders. The waves from the rest of Asia were not breaking over unimpeded the subcontinent.

However, mountains never acted as complete barriers to human movements. In fact, they have often acted as cultural saddles supporting the same type of culture on both its slopes. To some extent this has been true along India's northern mountain rim. The Pushtu-speaking people dwell on both slopes of the Hindukush offshoots forming the border with Afghanistan in NWFP. Central Asia intrudes in the northern heights of Hunza and Gilgit. To the north-east of Kashmir, Ladakh is called 'little Tibet', a label applicable to the southern slope of the mountains extending from Ladakh to Arunachal in the east. The influence of Myanmar is seen throughout the eastern frontier. Thus, though the mountains did not encourage human movement, they did not act as barriers either.

On a different level, however, the mountains have defined the lines of human movements, and one may discuss this in some detail. Beginning with Baluchistan, we first notice that the Pakistani Baluchistan is a part of Iranian Baluchistan and that there was no hindrance of communication from across the border in this sector. However, there are two major lines defined by the location of deserts in Iran and Baluchistan. The first is along the Kej valley beyond the Makran coastal range, and the second follows the alignment of the Chagai hills through the desert and eventually reaches Quetta. During the British period, a railway line was laid between Zahidan in eastern Iran and Quetta along the southern flank of the Chagai hills and served in the 1960s as a part of the Hippie trail.

Taking up the northern mountain rim at its north-western corner, the first major entry (in this case from south Afghanistan) is provided by the Bolan pass which basically marks a river defile across some high ridges

and higher mountains with its two mouths of the Khojak and Bolan passes. Further up is the Gomal pass marking the defile of the Gomal which eventually joins the Indus. Between the Gomal and the more northerly Khyber, there are quite a few passes (for instance, along the courses of the Tochi and the Kurram), providing entry from the Afghan side. These are not historically famous but are important to understand the mosaic of archaeological cultures and stray finds in these borderlands. At the height of the British rule of the subcontinent, the Khyber acquired a fame disproportionate to its historical significance, mainly because of the tribesmen ever ready to exchange fire with the British soldiers and partly because of the romantic aura these tribesmen are invested with in Rudyard Kipling's stories. The Swat defile skirts the Khyber and so does the flow of the Kabul river. In this sector there are several links, with the more significant of them leading to north-east Afghanistan or Badakhshan/Kafiristan. Some routes between Peshawar and Chitral lead to the Pamirs, the most famous of them going via Hunza and Gilgit. This Karakoram Highway is now encouraged as a tourist attraction by the Pakistani authorities. There were two major central Asian trading marts beyond the Pamirs—Kashgar and Yarkand. There were routes to central Asia from the direction of Leh in Ladakh as well, skirting the foot of the high peak of Muztagh Ata.

At this point mention must be made of the fact that all these routes across the Karakoram, and at least the main ones which went to Afghanistan, were feeders of the famous Silk Route which went all the way from China to Rome in the early Christian era. Another fact which calls for attention is that the routes across the main Hindukush massif in central Afghanistan were closely linked with the routes moving into, or coming from, the subcontinent. It was along such routes that Buddhism spread to central Asia, China and beyond, and there are many Buddhist statues and painted caves standing sentinels along these hill and desert paths. The famous Buddha images of Bamiyan in the Hindukush, the sensuous ivories of Begram in the Kabul region, the caves of the thousand Buddhas at Dun Huang at the edge of the Taklamakan desert—these are only some of the beauteous things marking the trail of merchants, monks and pilgrims along these routes. In the early centuries AD the entire region from the deserts of central Asia or at least the Oxus–Jaxartes system to the heart of Gangetic India was under one political domination—that of the Kushana dynasty.

Moving further east, one encounters the long alignment of the Himalayas with the Tibetan plateau on the other side. The major entries into Tibet are widely spaced: Shipki La which can be reached by following the Sutlej gorge from Simla; Niti pass which lies in the heights of Uttar Pradesh; and the Chumbi valley between Sikkim and Bhutan. There is easy

access from the heights of the Tibetan plateau into Arunachal in north-east India, the Tawang-Bomdila alignment being well known.

It is possible to travel to Yunnan in south China through the Sadiya frontier, a route dating back to the 10th–12th centuries AD. Further to the east one can reach Burma or Myanmar in a number of ways, but most importantly, through the Manipur valley. The routes led to Bhamo in northern Myanmar, which was an entrepot of Chinese trade in the nineteenth century. According to some, this alignment marked a southern version of the Silk Route in the late centuries BC and early centuries AD. Another major overland connection was maintained with Myanmar along the Chittagong coast.

A look at the map of the world suggests India's central role in any traffic in the Indian Ocean. The Indus delta and the Gujarat coast have been traditionally linked with the Gulf, and the modern smuggling runs between Dubai and the Bombay coast only continue a much earlier tradition of movement in sailing vessels. The west coast has also enjoyed traditional mercantile intimacy with the east coast of Africa. A hoard of Kushana coins has been found in Ethiopia and Axumite coins (*c.* fifth century AD as a central point) of Ethiopia have been reported from India, suggesting an untold story of India's African connections. With the expansion of the Roman trade, which included the entire area up to China in its maritime network, there was a greater emphasis on India's role in the Indian Ocean trade. There were many ports along the coast, all linked to the Mediterranean and south-east Asiatic trade. The river mouths played an important role in this trade, particularly those of the Narmada, the Kaveri and the Ganga. Thus, the geography of ancient India certainly ensured that she could maintain an archaeological and cultural distinctiveness of her own.

*Frontiers and Boundaries*

The boundaries of modern nation states are products of various historical situations. For instance, the north-western boundary of India, the Durand Line, was delimited only in 1893, with the local details worked out still later. The main boundary line between India and Tibet, the McMahon Line, was arrived at only in 1913–14. Such boundaries basically reflect the political forces which shaped them. They may be based on some geographical parameters but geography is not their sole—and occasionally not even primary—determinant. The Radcliffe Line which divided Bengal in 1947 had very little to do with geography.

However, the term 'frontier' in archaeology denotes something wider. It reflects a shaded territory which may be somewhat ill-defined on the ground but is broadly indicative of a transitional zone between two major

geographical areas. This tends to denote sections where the influences from both the flanking geographical areas have been historically operative. On a general level, the 'frontiers' are basically interaction zones. Theoretically, such interaction zones—areas of geographical and cultural transition—are available all along the north-western, northern, north-eastern and eastern political boundaries of the subcontinent. However, not all these zones have been historically significant to an equal extent. From the point of view of the subcontinent's history, it is the north-western frontier which is most significant. Not only did the rich political and cultural worlds of Iran and central Asia lie on its other side, it was here that these worlds met the world of India. The alignment of the subcontinent's northern frontier abutted on the cold heights of the Tibetan plateau which did not go much beyond the carving of a religious kingdom and (on the Indian side) trans-Himalayan trade carried on mule backs. The bamboo-clad high ridges of the eastern frontier did not encourage much human movement except through the lateral valleys of Manipur, and even on the other side, the northern stretch of Myanmar was not a historically significant area. The focus of Myanmar's ancient history lay lower down in the Irrawaddy valley and further south. In fact, the only segment of the eastern frontier which can claim some historical distinction is the Chittagong-Arakan sector because by the fourth century AD there was a kingdom in Arakan using Sanskrit language, and still earlier, there was a prehistoric fossilwood industry spanning the 500 km stretch between the Lalmai hills of Bangladesh, the western Tripura hills in India and the area to the south of Mandalay in Myanmar.

The north-western frontier as an interaction zone is fairly wide and covers the southern part of central Asia, the eastern rim of Iran which runs from Meshed in the north-east to Zabul and Zahidan in the Iranian Seistan, Afghanistan, and the Indus valley and Kashmir in the subcontinent. Both politically and economically these areas constitute a single interaction zone. Politically, the entire area was unified under the Kushanas of the early centuries AD. In other periods it was politically fragmented, a process subject to both subcontinental and central and west Asiatic factors. To give only one example, the Mauryan kingdom based in Patna stretched up to the southern flanks of the Hindukush whereas its northern side was subject to post-Alexandrine Greek control. It is this overall area which was the springboard of various pre-Islamic and Muslim invasions of India, but virtually in all cases the so-called invaders belonged to this interaction zone and were thus in a sense parts of the south Asian mosaic. The second element which binds this zone together is economic interaction, a fact which is archaeologically and historically well documented. Even now, every

winter there are large-scale movements of *Powindah* traders from Afghanistan to Pakistan. While coming they bring goods from Afghanistan, and on their return journey to the cooler heights of the Hindukush before the onset of summer, they carry goods from the subcontinent. An interesting historical sidelight on this economic interaction is the wide distribution of the Hindu *bania* or mercantile network covering virtually the whole of this segment of Asia in the nineteenth century and earlier. Archaeologically, this wide stretch from the Oxus to the Indus needs careful attention; too often the distribution of artefacts, which possibly suggests nothing more than the goods of itinerant merchants, has been taken to connote the movement of people and/or diffusion of culture.

*India as a Geographical Entity*

The geographical diversity of the Indian subcontinent is well known, and occasionally one has gone to the extent of arguing that there was no such country as India and that what we call India today was only an offshoot of the European dominance of the land. In any attempt to introduce the Indian land mass, this issue deserves some consideration. The first point to note is that modern nation states are products of modern political forces, and as nation states many European countries did not take shape before the nineteenth century. India's case is hardly an exception.

What is perhaps more relevant to understand India as a geographical entity is a number of historical and cultural facts which suggest that in the ancient period itself there was a notion of India being such an identity. We have already drawn attention to the *Vishnupurana* which refers to the land between the Himalayas and the sea as belonging to the descendants of the mythical king, Bharata. Perhaps more important is a persistent reference in the ancient political texts to the domain of an universal emperor—*Chakrabarti-Kshetra*. It is the total subcontinental land mass which constitutes this ideal domain. So an ideal of political unity was always there, although that ideal was only infrequently achieved.

Hinduism is deeply rooted in the Indian landscape, with some of its features apparently underlining its pan-Indian geographical frame. A few examples will suffice. The major textually sanctioned centres of *Shakti* worship or the worship of the female principle/energy in the subcontinent are distributed right from Hinglaj in the Makran hills of Baluchistan to Sitakunda near Chittagong in the extreme southeast. The major centres of Saivite pilgrimage extend from Pasupatinath near Kathmandu to Rameshwaram in the deep south. While performing an obligatory ritual for one's dead ancestors at the famous Hindu sacred place of Gaya on the bank of the Falgu river, the pilgrim is identified in a moving ritual hymn as belong-

ing to a land with many rivers. The names of these rivers are interesting in the present context because they include all the major ones from the Indus to the Kaveri. There seems to be truth in the *Vishnupurana* notion of *Bharatavarsha.*

*Major Geographical Lineaments of Indian History and Archaeology*

There are a number of major divides in India's historical geography, and to understand the geopolitical factors in operation it is important to know them. The first divide is the line which one draws joining Delhi, the Aravalli hills and the Gulf of Cambay. In one sense this marks a secondary area of influence of the Indus–Oxus interaction zone, and in another sense this carries the thrust of the Ganga valley to the Indus–Oxus stretch. This is a kind of marchland where the influences emanating both from the Ganga valley and the Indus–Oxus interaction sphere have been operative. The second major divide is based on the line of the Vindhyas and the Satpuras. In a loose sense, the alignment of these ranges represents a north–south divide; unless one travelled to south India along the Orissan coast from east India or along the Konkan coast from Gujarat, one could move from Gangetic India to the south only across this divide. The third major divide is the terai belt separating the northern hills from the plains below. Until comparatively recently, the terai was both swampy and jungly and not subjected to large-scale clearance till the commercial needs for timber and tea plantations were felt.

A good example of the geopolitical forces operative in Indian history is the case of the Satavahanas of the late pre-Christian and early Christian era, and the Marathas of the second half of the seventeenth century AD and later. Their epicentre was the upper Godavari valley. For any ambitious political power with this epicentre, a number of geographical possibilities were open for expansion. It certainly was possible to move towards the Gujarat coast with a share in Gujarat's maritime wealth in mind. It was also possible to try to carve out an access to the Ganga plains through Malwa in central India. Third, nothing prevented the movement towards Vidarbha from the upper Godavari valley. In the southern direction, a major emphasis would be on the control of the Konkan coast and southern Deccan. Having secured a foothold in southern Deccan, one could think of moving towards the coast of Tamil Nadu and Andhra. Eventually, success would depend on the political situations of the areas in the line of the possible movements, but these lines are geographically defined. If one would compare the political movements of the Satavahanas and the Marathas, one would, in fact, find a lot of similarities which were conditioned by the identical geographical choices open before them. An equally important

point is that it is not always a question of the macro-geopolitical choices that we have laid down for the Satavahanas and the Marathas; the smaller features of the terrains within individual areas also deserve a close study. The routes, agricultural pockets, resource areas, etc have all a part to play in the historical configuration of the area. and a knowledge of them will aid our understanding of the long-term geographical impulses running through the course of Indian archaeology and history.

### *Areas of Attraction, Relative Isolation and Isolation: a Critique of the Idea*[11]

This scheme is based on the idea of grading the different areas of the land in terms of population, agriculture and the frequency of the location of historical kingdoms. In F.J. Richards' classificatory system there were four so-called 'areas of attraction': the Ganga plain, the south, the Krishna– Godavari delta of Andhra, and Gujarat. Later, this simple classification became elaborate in the writings of O.H.K. Spate and B. Subbarao. In Subbarao's scheme, the areas which fall in the category of 'areas of attraction' are Punjab, the Indo-Gangetic divide, Ganga basin, Malwa, Maharashtra, Karnataka and Tamil Nadu. The 'areas of relative isolation' included Sind, Marwar, Gujarat, Saurashtra, Konkan, Kerala and Assam. The Aravallis, the central Indian highlands and similar forested areas were considered 'areas of isolation'.

The only value of such classifications is that it tries to provide a geographical framework for the understanding of the process of multilineal cultural development in India. But such classifications may also be historically inaccurate. The forested areas of the subcontinent, arbitrarily relegated to the areas of isolation, have, in fact, been primarily resource-bearing areas, and from this point of view alone, they can hardly be called isolated from the main productive forces of the subcontinent at any point of history. To give another example, Gujarat has been supposed to belong to the area of relative isolation. On the contrary, Gujarat was always in the forefront of India's maritime enterprises and thus in the forefront of economic development as well. To sum up, geographical categories and lines or divides are no doubt important, but one has to be constantly aware of their historical dimensions.

## PEOPLES AND LANGUAGES: THE BASIC CLASSIFICATORY FRAMEWORKS

We have already commented on the elements of geographical diversity and homogeneity in India. It remains for us to do the same for her people and

languages. The elements of diversity form a major theme in this context too, but one has first to understand the basic conceptual frameworks of these postulated diversities and the extent to which they can be said to provide clues to an understanding of Indian archaeology and history. The problem, in fact, lies in a wider area of correlation between the biological attributes of a human group, their language and their archaeological and historical past. This was a cardinal—almost an axiomatic—assumption of archaeological and historical studies for a long time and formed the basis of judging history in terms of 'superior' and 'inferior' 'races'. There are many believers in this approach, even in the modern world. In the context of the subcontinent alone there is a voluminous literature on this topic, and no student of Indian archaeology or history can avoid running into the various classificatory schemes proposed for Indian people and languages.

### *Recent Approach of the Anthropological Survey of India*

The People of India project undertaken by the Anthropological Survey of India between 1985 and 1992 has identified approximately 4635 communities, located and studied in all 'states' and 'Union Territories' of India. Obviously, this relates only to modern India. The other areas of the subcontinent, if surveyed from this point of view, may substantially increase this number. Several volumes of the Indian data have already been published, including the volume which discusses the methodology of the conceptual framework of this classificatory exercise.

At the centre of the whole exercise lies the concept of 'community'. Having first defined community as being marked by territoriality, the 'we' feeling and a partial social system, the work sets its store on the ethnographic features of endogamy (i.e. marriage within the community), occupation and perception. Community has been considered a better term than caste, tribe and other non-caste categories because the original aspects of these latter categories have been breaking down in modern India. In view of the breakdown or weakening of their traditional features, community, or to use an Indian term, *samudaya*, seems to be a more appropriate concept for an all-India reference than caste with its various local names. The second major point to note in this context is that a community is a dynamic category, continually redefining itself, its relationship with other communities and with its social and physical environments. As K.S. Singh, the author of the first volume of this project, writes,

> No definition can be too precise at any point of time. Definitions change. For instance, there was no single definition of a tribe and yet the tribe continued to be studied. Similarly, even if there was a difference about the notion of a community, it should be studied.[12]

The work has identified four types of communities. The first type comprises very large categories, including castes and minorities. The second type denotes mostly the major linguistic and cultural categories, such as the Assamese, Bengali, Oriya, etc. Even when they emigrate they are known by the state and the language area to which they belong. There is a third type of community—only about half a dozen of them—which does not conform to the three-fold criteria of endogamy, occupation and perception. The fourth type of community—Adi Dharma, Adi Karnataka, Adi Andhra, etc.—came up in the wake of the constitutional reforms of the 1920s and 1930s and continues to figure in the Government of India list of 'scheduled castes'.

Of the 4635 identified communities, there are 2209 main communities with 586 segments (mostly major). But, when one considers the distribution of the communities and their segments over states and the Union Territories, their number goes up to 4635. Even a brief listing of these communities does not concern us here, but one can certainly point out the infinite background factors leading to their community perceptions and identifications. In many cases, it is the nature of occupation. Whether one catches snakes (*Sapera*) or makes bamboo baskets (*Bansfors*), it is reflected in his community name and perception. The places of origin can play a role too; for instance, there can be a community called *Kanpuria*, the group from Kanpur. Religious affiliation can also identify a community; for instance, the *Kabirpanthis*, the followers of Kabir, have formed a community. Even mendicants sometimes group themselves into communities, such as the *Aghoris*, *Bairagis*, and *Fakirs*. The narration is almost endless. Sometimes, there are markers of dress, ornaments, body-markings, etc. to denote particular communities. Members of the *Lingayat* community of south India carry a small *Linga* or phallus, the emblem of Siva, around their neck. A study of Indian communities in relation to their food habits reveals that only about 20 per cent of them are vegetarians, with the males being mostly non-vegetarians. Alcoholic beverages are common too; alcohol is occasionally used in 2469 communities and regularly in 1106. Such grassroots realities contrast sharply with the traditional Indological image of India.

An overwhelming number of communities are linguistically homogeneous, but the incidence of bilingualism is as high as 64.2 per cent in terms of the number of communities. Even the number of scripts is apparently in a state of flux; there are 11 scripts used by the scheduled languages, but many groups are re-inventing their 'lost' script in search of a distinct identity. The Santal script of *Ol Chiki* invented by a Santal savant, Raghunath Murmu, and officially recognized in the state of West

Bengal, is one such example. The morphological and genetic traits are not, however, clustered around individual communities; data collected in this regard suggest that the variability of genetic and morphological traits is more within communities than between them. There are wide variations in the range of social organizations, beginning with clan organizations, marriage patterns, marriage symbols, and so on. Many of these variations are related to status, power and dominance of various community segments. The concept of purity and pollution is very important in allocating places in the basic social hierarchy which is by and large conditioned by the fourfold *vama* system, including the fifth category of untouchables. However, the varna system is not universal; only 68.5 per cent of the communities are reportedly aware of it, with the tribals or at least most of them standing outside this system. There are dual varna categories in 104 communities. To give an example, at least 54 communities recognize themselves as both Brahmins and Kshatriyas. More interestingly, among the 584 Muslim communities, 53 still recognize their place in the varna system, with 12 of them identifying themselves as Brahmins. The same is true of the 339 Christian communities which have been studied: 76 of them consider themselves to be part of the varna system. The hierarchical divisions within a community can be impressive; but what is interesting now is that many of these distinctions are gradually disappearing and there is more emphasis on the identity of the community as a whole with the formation of political associations. Religious affiliations also are not static; there are various levels and forms of Hinduism, from monism to plain shamanism. The survey identified 70 traditional rural occupations, with the artisan communities having a countrywide distribution. Some of the widely distributed occupational groups are leather-workers (*Chamars*), mendicants and beggars (Jogis), potters (*Kumhars*), oil-pressers (*Kalu*) and barbers (*Nai*). Again, none of these occupational groups has remained static.

The image of diversity notwithstanding, society is not perceived to be fragmented by Indians; to them it is a kind of 'honeycomb in which communities are engaged in vibrant interaction, sharing space, ethos and cultural traits both at local and regional levels'.

On a theoretical level this sharing of space, ethos and cultural traits is better explained by the results of a much earlier Anthropological Survey of India study of the distribution of the material traits of life in the country. The relevant material traits were forms of villages, types of cottages, staple diet, oils and oil-presses, ploughs and husking implements, male and female dresses, footwear and bullock-carts. Some degree of regionalism is evident in the distribution of these traits, but, as N.K. Bose comments,

this regionalism seems to be on the whole independent of language as well of physical types. This means that the plough or the husking mortar and pestle, the unsewn cloth worn and regarded as ritually pure by women, the forms of villages, of oil-presses and methods of cooking food in oil, etc., show a kind of kinship between the peasant folk, the weaver, the potter, etc. of various parts of India which is quite likely to be overlooked.[13]

The degree of differentiation is said to be less in respect of the country's social organization. Similarities are many between the various castes and the linked productive organizations in different parts of the country, the distinction being based on finer shades only. Besides,

as one considers other spheres of life, namely things like laws which guide inheritance or define the rights and duties of individuals in a kin group, or if one rises to higher reaches of life confined to ideals or faiths or art, the differences which one has noticed at the material level of life become feebler. They are eventually replaced by a unity of beliefs and aspirations which gives to Indian civilization a character of its own. The structure of Indian unity can therefore be compared to a pyramid. There is more differentiation at the material basis of life and progressively less as one mounts higher and higher.[14]

### *The Classificatory Systems Based on the Concept of Race*

A well-known and certainly more deep-rooted approach to the study of Indian people is the system of racial classifications which crystallized at the turn of the twentieth century and is principally associated with H.H. Risley. He first published his all-India scheme of races in 1901 as a part of the report on the Indian census of that year.

Before we turn to Risley, it might be useful to take a historical look at the concept of race itself. In its essentials, this concept is based on a study of human physical characters, comprising skeletal and surface features. The shape and size of the skull vault, face, nose, jaws and teeth, development of brow-ridges, projection of the cheek-bones, projection of the jaws, stature, body-build and proportion of the limbs and their segments constitute the skeletal features. Among the surface features one may note skin colour, hair form and colour, eye colour and folds, the form of the lips and the extent to which they are everted, and some peculiarities like steatopygia (an unusual accumulation of fat on buttocks and thighs). The study of all these elements did not become significant at a single point of time. However, the study of the cephalic/cranial indices has long been a major part of the racial classificatory systems. Cephalic or the cranial index is the proportion of breadth to the length of the head or skull: brachy or broad-headed (80 per cent +), meso or medium-headed (75–80 per cent), and dolicho or long-headed (less than 75 per cent). Similarly the relation of the breadth of the nose to its height supposedly classifies people into platyr-

rhine (85 per cent and above: broad-nosed), mesorrhine (75–80 per cent: medium-nosed) and leptorrhine (less than 70 per cent of the height: narrow-nosed) groups.[15]

A number of features may be noted about the concept of race. First, various language elements have come to be mixed with this. Although many scholars theoretically disown such a linkage, in practice, when they write about race and racial classifications, the linguistic correlations generally creep in. Second, the racial classifications very often carry the tone of superior and inferior races. This element of racial hierarchy has been adduced virtually in every context since the second part of the eighteenth century when the idea of races was first systematically laid down. This has strong undertones in modern political and social situations. Its strongest manifestation took place in Nazi Germany. Third, the essential framework of grouping mankind into such categories as Caucasoid, Mongoloid, Negroid, etc. continued uninterrupted and unchallenged till recently. With its categorical hierarchy of superior/inferior races and their assumed roles in the march of civilization, such classifications offered an unmitigated racist approach to history. Fourth, although after the Holocaust of the Jews under the Nazi regime in Germany and the American Civil Rights movement, there is less preoccupation with race as a conceptual category of great historical significance among scholars, the idea has by no means lost its votaries in the academia.

It must, however, be strongly emphasized that an increasing number of biological anthropologists no longer believe in this concept. In an edited volume called *The Concept of Race* and published as early as 1964, the anthropological concept of race has been described as an 'omelette which corresponds to nothing in nature' and does not have any existence 'outside the statistical frying pan in which it has been reduced by the heat of the anthropological imagination'[16] On the basis of their statistical study of the Indian populace in 1990, P.P. Majumdar and his associates at the Indian Statistical Research Institute, Calcutta, unambiguously showed that 'the people of India cannot be classified into a fixed set of ethnic categories based on anthropometric data.'[17] According to them research should concentrate on the sources of anthropometric variation and attempts to arrive at typological/racial classifications should be abandoned. However, the literature on Indian archaeology is still replete with references to race in slightly disguised form of ethnicity.[18]

By the end of the nineteenth century the method of racial classification based on cephalic index was well accepted in Europe, and throughout the second half of that century there was also a growing concern with the need for a classification of Indian people. It was not primarily an academic con-

cern. The main purpose was to serve the interest of the Empire by giving scientific sanctity to the common perception of multiple divisions of 'caste, tribe and race' among the Indian people. This would eminently serve the cause of 'divide and rule' on the one hand, and, on the other, it would lead to an aggravation of divisive feeling among people themselves, which in turn would lead to some political consequences as well.

All secret societies of a dangerous political character are impossible in a population, which is honeycombed with deep, though innocent fissures; the panchayat of the caste is a welcome and powerful ally to a Just Ruler; the old Roman proverb applies, Divide et Impera. ... I am glad to hear that there is a prospect of an Ethnological Survey of British India.[19]

In 1886–88 Risley conducted a survey in Bengal, Bihar, UP and Punjab and published the resultant anthropometric data and ethnographic glossary in 1891. The tradition of classifying Indian people into 'communities' of various kinds, which we have observed in the Anthropological Survey of India 'People of India' project, goes back to this publication by Risley. For instance, under the entry *Lalbegi*, one gets their description as a class of Muslim sweepers from upper India who were generally employed as sweepers in the European households. However, Risley's main classificatory system of Indian population was published in his chapter on 'caste, tribe and race' in a report related to the 1901 census.

According to Risley, there are basically seven racial categories of Indian people:

(1) *The Turko-Iranian*: The Baluch, Brahui and Afghans of Baluchistan and NWFP belong to this category. They are a mixture of Turki and Iranian elements, with the latter dominating, above average in stature with a fair complexion, dark, occasionally grey, eyes, plentiful facial hair, broad head, prominent and very long nose.

(2) *The Indo-Aryan*: Rajputs, Khatris and Jats of Punjab, Rajputana and Kashmir belong to this category. They are mostly tall in stature, with fair complexion, dark eyes, plentiful facial hair, long head, narrow and moderately prominent nose. They most closely resemble the traditional Aryan colonists of India.

(3) *The Scytho-Dravidian type*: The Brahmins in Maharashtra, and the Kunbis and Coorgis of western India form this type. The Scythian element is preponderant in the higher social group and the Dravidian element in the lower. They are of medium stature, with fair complexion, comparatively scanty facial hair, moderately long and fine nose and broad head.

(4) *The Aryo-Dravidian type*: They are distributed in UP, parts of

Rajasthan, Bihar and Sri Lanka, with the upper strata being indicated by the 'Hindustani Brahmins' and the lower by the 'Chamar'. They are of lower stature, and have medium to broad nose, lightish brown to black complexion and medium head. They are a mixture of Indo-Aryan and Dravidian elements.

(5) *The Mongolo-Dravidian type*: The Brahmins and Kayasthas of Bengal, Muslims of eastern Bengal, and miscellaneous regional groups belong to this group. They have dark complexion, medium to broad nose, medium stature and plentiful facial hair.

(6) *The Mongoloid type*: They are distributed in the Himalayan belt, inclusive of the Bodos of the Brahmaputra valley. They have fine to broad nose, flat face, oblique eyes, small stature, yellowish complexion and a broad head.

(7) *The Dravidian type*: They are found distributed in the Peninsula with the Paniyans of south Indian hills and the Santals of east India constituting the typical examples. They have a broad nose depressed at the root, short stature, dark complexion, occasionally curly hair, dark eyes and long head.[20]

Risley's classification was based as much on his perception of the Indian past and the history of Indian languages as on anthropometric data. Among his theoretical observations one may note the following two points. First, he asserts that the prevalence of the caste system in India with its emphasis on marriage within the caste was a major factor in the maintenance of racial purity. Second, he makes easy correlations not merely between race and language but also between race and occupation. The concept of racial superiority/inferiority is also very much there, the topmost position in the hierarchy being given to the Indo-Aryans. In the second half of the nineteenth century, the concept of the Aryans gained major ground on the basis of comparative philological studies. The *Rigveda* being the earliest 'Aryan' text, the upper castes of India had to fall into the Aryan (or, in this case, Indo-Aryan) fold, and through this affiliation they could also claim a cousinship with their 'Aryan' English rulers. Now, with the Indo-Aryans at the top of Risley's racial hierarchy there was naturally a clamour among the Indian upper castes to lay claim to as much Aryanness as possible. An Indian scholar, R.P. Chanda, went to the extent of writing a book titled *Indo-Aryan Races* to argue that the Bengali upper castes did not derive their broadheadedness from the Mongoloids, as Risley argued, but from some good 'Aryan' skulls in the Taklamakan desert. The study of India's ancient past had, in fact, become completely racist by this time.

A major modification of Risley was attempted only in the 1931 census operations conducted by J.H. Hutton. A section was written on the racial

affinities of India by B.S. Guha of the Anthropological Survey of India and Hutton himself contributed a section on India's racial history. The details of the Guha classification are not our concern here; the ways in which the racial basis of the Indian population have been determined should be clear from Risley's pioneering scheme mentioned earlier. However, Guha's racial types were briefly the following: dolichocephalic short-statured, dolichocephalic tall-statured, brachycephalic medium-statured, short-statured with strongly marked brow-ridges (a group of 'aboriginal' population), pigmy strain with spirally curved hair (another 'aboriginal' group), brachycephalic Mongoloid in the Himalayan arc, and finally, a second Mongoloid strain on the eastern borders. On the basis of the available skeletal evidence Guha also offered a racial history of India: three racial types around the time of the Indus civilization—long-headed with high cranial vault, long-headed with lower cranial vault, and a broad-headed Armenoid type. The Iron Age South India was marked by another phase: long and high-skulled 'megalithic people' responsible for introducing agriculture in India and subsequently pushed to the south. Guha's third phase was marked by the imposition of a race with Armenoid affinities on the Iron Age race at a later date.

Hutton's racial history was more culturally oriented and laid the foundations of the kind of correlations that one can find among the writings of many subsequent scholars. The earliest race was Negrito, about which nothing is said except that it came from outside. The second group which came from Palestine is the Proto-Australoids, associated with an agglutinative tongue from which the Austro-Asiatic language was derived. They were followed by an early branch of the Mediterranean which introduced a rudimentary form of agriculture and navigation. A later branch of the civilized Mediterranean followed, to be followed in their turn by the Armenoid branch of the Alpine race which developed the Indus civilization and spoke Dravidian. In the third millennium BC there was an Indo-European-speaking brachycephalic race, whose main course went along the west coast and a lesser course to the Ganga valley. In the extreme south other (undefined) movements went on, including those of southern Mongoloids. Finally, around 1500 BC the Indo-European migration took place to Punjab and led on to produce 'the philosophy, religion, art and letters that were the glory of ancient India'.[21]

The exposition of ancient Indian racial and cultural history that one finds in modern books on ancient India generally follows the Guha-Hutton line of argument. As late as 1994, the editors of the Anthropological Survey of India monograph, *The Biological Variations in Indian Population,* discuss ethnic classifications, especially B.S. Guha's scheme.

There is also an elaborate scheme of language migrations to India, generally coinciding with the postulated racial migrations. We have seen some indications of this in Hutton's scheme of India's racial history. The linguistic survey of India was carried out by G.A. Grierson between 1903 and 1927. Its published volumes constitute the basic reference point of the study of Indian languages.[22] Their main families are four: Indo-Aryan, Dravidian, Austric or Austro-Asiatic, and Tibeto-Burman. Occasionally the names differ but that is not important. All these languages have their sub-divisions. The 1951 census gives a total number of 845 languages and dialects spoken in the modern state of India alone. The number will obviously increase if the other nation-states of the subcontinent are taken into consideration. The classification undertaken by Grierson, which also covered Myanmar because till 1937 it was a part of the British Indian territory, listed a total of 179 languages and 544 dialects. The majority of the people speak various languages of the Indo-Aryan family; about 20 per cent speak the Dravidian languages; and a much lesser proportion speak languages of the Tibeto-Burman and Austric groups. The number of scripts in use in India are many, with most of the regional languages having their own scripts. At their roots is the dominant ancient script of the land, *Brahmi*. The historical development of this script in different regions led to the various modern scripts. There are about 11 major scripts, numerically the dominant one being *Devanagari* which is used for Hindi.

## Concluding Remarks

The purpose of the present chapter was to focus on the academic and physical context of what will be discussed in the rest of the book. Because archaeology is concerned essentially with the story of human cultural growth in the physical context of land, the land cannot be put outside the general academic milieu of its study. This is why we have put these two contexts together. Besides, throughout our subsequent discussion on the course of India's evolution from the palaeolithic stage to the early historic foundations, geography, *i.e.*, the context of land, will form a major backdrop of our analysis. In fact, if any particular perspective may be said to dominate the academic logic of our study, that is an unqualified concern with the geographically multilinear character of the subcontinent's archaeological development.

Finally, we may here draw attention to another theoretical point. Because of the intrinsic character of its data and of the time-span over which these data are spread, archaeologists are forced to take an essentially long-term view of history at the grassroots level. To use the evocative words of

a French historian (Braudel 1980: 12), this kind of history is the history of man 'in his intimate relationship to the earth which bears and feeds him; it is a dialogue which never stops repeating itself, which repeats itself in order to persist, which may and does change superficially, but which goes on, tenaciously, as though it were somehow beyond time's reach and ravages.' Although Braudel did not write this specifically in the context of archaeological past, we feel that this vividly echoes a very important part of archaeological reality, and we have tried to remain aware of it throughout the course of this volume.

# II

# The Palaeolithic Context

## Research Background

The modern phase of palaeolithic studies in India began in the 1930s when there were attempts to go beyond the succession and distribution of artefacts and consider the issues of related environment and geochronology. The most significant publication of this period was *Studies on the Ice Age in India and Associated Human Cultures* by H. de Terra and T.T. Paterson in 1939. This was based on their work (1935), in collaboration with Teilhard de Chardin, from Kashmir to the Salt range, with a detailed focus on the Soan river valley, a tributary river valley of the Indus. Its background was provided by a few earlier discoveries in this region which drew the attention of de Terra who was a geologist.[1]

The interrelationship between the stratigraphic profile of prehistoric tools and related environment was first highlighted in a major way in India by a study of tools collected in the eastern ghats of the Andhra region by L.A. Cammiade, who collaborated with M.C. Burkitt of Cambridge University in 1930. Their observations were the following:

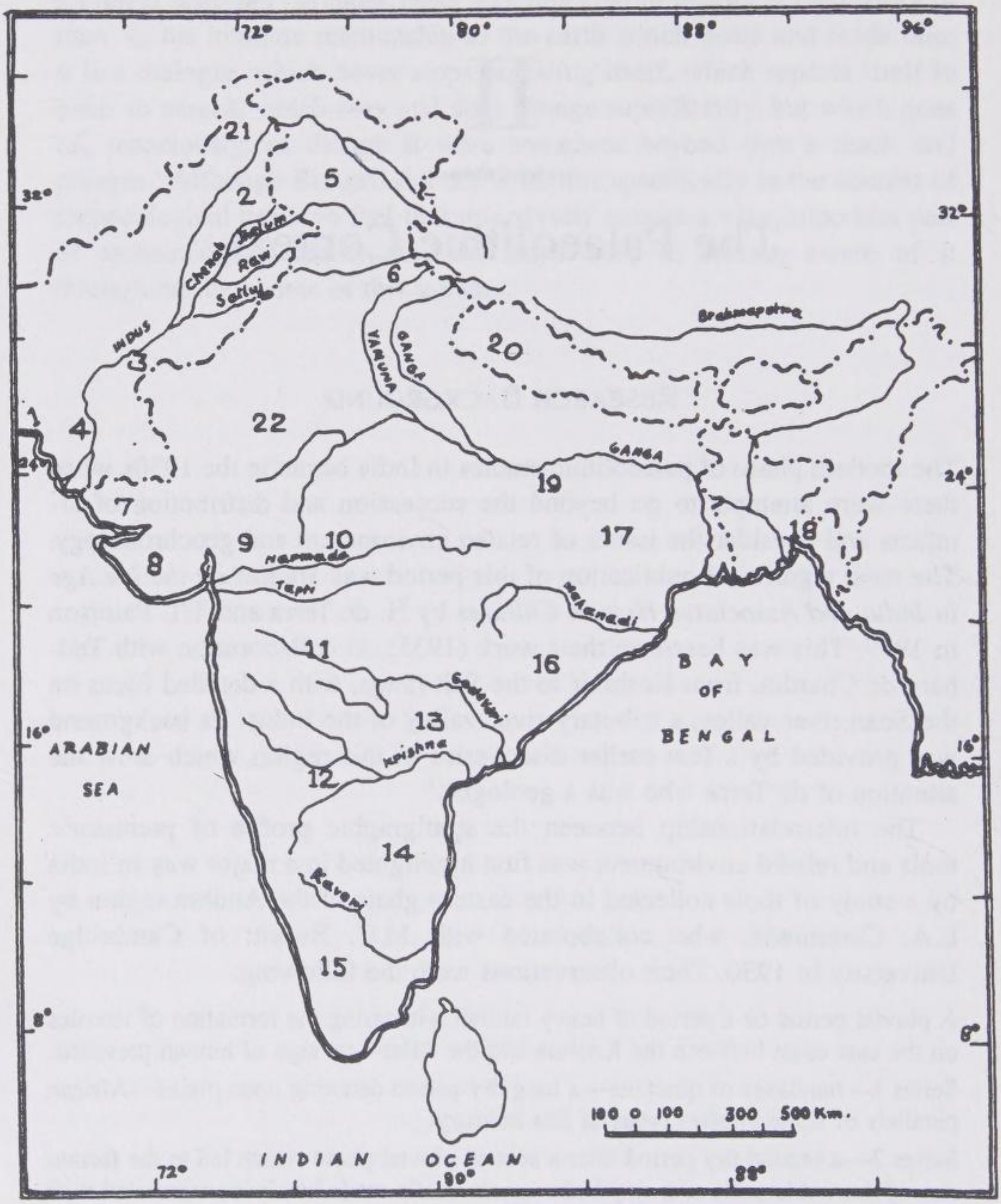
A pluvial period or a period of heavy rainfall witnessing the formation of laterites on the east coast between the Krishna and the Palar—no sign of human presence.

Series 1—handaxes of quartzite—a long dry period denoting open plains—African parallels of some artefact types of this industry;

Series 2—a second dry period after a second pluvial phase which led to the formation of detrital lateritic and clay beds—more neatly made handaxes associated with a flake industry—raw material quartzite but some sandstone and chalcedony as well—this series of tools continues to occur in the river alluvium of a phase which is humid but not humid enough to suggest pluvial conditions;

Series 3—decrease in the rainfall leading to denudation—the presence of blunted back blades, burins, end-scrapers and 'planing tools' of a flinty nature such as Lydian stone;

Series 4—similar climatic condition—the large-scale occurrence of microliths.[2]




*This map is neither accurate nor to scale*

Map 1 Major Palaeolithic Distribution Area: 1. Las Bela, 2. Potwar Plateau, 3. Sukkur-Rorhi hills, 4. Milestone 101, 5. Kashmir and Ladakh, 6. Panjab Siwaliks, 7. Kutch, 8. Saurashtra, 9. mainland Gujarat, 10. Narmada valley, 11. Maharashtra, 12. Karnataka, 13. Andhra, 14. Tamil Nadu, 15. Palghat area of Kerala, 16. Orissa, 17. West Bengal and Bihar, 18. western Tripura, India and Lalmai hills, Bangladesh, 19. Son and Belan area, 20. western Nepal, 21. Northwestern Frontier Province, 22. west and east Rajasthan

Observations of more or less the same type were made in 1932 by Cammiade, Burkitt and F.C. Richards regarding a collection of tools near Madras.

However, the Terra–Paterson work is more significant because it went beyond such palaeoclimatic correlations and introduced a geochronological scale on the European model. Moreover, having established a geochronological scale for its main study area between Kashmir and the Salt range, it extended the framework, through archaeological comparisons, to include the Narmada valley in central India and the area around Madras in the south. The point is not whether they were successful or even logical in their quest. What is relevant is that they were believed to be successful and logical till the 1980s when the scientific basis of their groundwork was found to be wanting even in the context of the Potwar plateau where they primarily worked. Thus, it was a dominating influence in Indian palaeolithic research for a long time, and it is worth knowing, even at this chronological distance, what the work meant.

Basically, what they did was to postulate the existence of a number of tool-bearing terraces along the Soan river and correlate them to the already known Quaternary glacial cycle in Kashmir. The correlation was on the following basis: T-D = II glacial; T-1 = II interglacial; T-2 = III glacial; T-3 = III interglacial; T-4 = IV glacial; T-5 = recent. The last terrace, T-5, is immediately earlier than the present level of the river. Further, a complete parallelism was assumed between the Himalayan glacial cycle in Kashmir and the Alpine glacial cycle in Europe so that there was no difficulty in understanding the Soan valley succession of stone tools in terms of a global geochronological perspective.

In the Narmada valley of central India, four terraces were recognized by de Terra only in the tributary valleys but they were impossible to distinguish in the main valley where three different cycles of sedimentation were recognized. These cycles of sedimentation came to be known as the 'lower group', 'upper group' and 'regur or cotton soil group'. In the present context, regur or black cotton soil is irrelevant. The lower and upper groups both show a gravel bed followed by a bed of clays and silts. The gravel bed or the boulder conglomerate of the lower group is more cemented than the gravel of the upper group. Similarly, the clay of the lower group is more intensely coloured and richer in concretions than the clay of the upper group. Thus, basically, it is a succession of cemented basal gravel, clay, finer gravel and clay, the whole being covered by regur or cotton soil. Two further points are noteworthy. First, there is no faunal difference between the two groups, *Bos namadicus*, *Elephas namadicus*, etc. being found in both groups. Second, Acheulian handaxes were found in the basal level

of the lower group, thus making the Acheulian industry contemporaneous with the deposition of the basal conglomerate. The upper group yields rolled Acheulian industry but there is also an unrolled and apparently contemporaneous assemblage of flakes and discoidal and pebble cores of quartzite and trap, recalling the Late Sohan industry of the Soan valley. According to the Terra–Paterson scheme of correlations, T-1 and T-2 of the Soan valley with their Early Sohan industry are contemporary with the 'lower group' of the Narmada whereas the Soan valley T-3 and T-4 are contemporary with the Narmada 'upper group'.

TABLE II.1

*The Soan Valley Sequence*

(after de Terra and Paterson, 1939)

1. T-D: Boulder Conglomerate—large, crude flakes dubbed 'Pre-Sohan Industry'.
2. T-1: redeposited Boulder Conglomerate—Early Sohan Industry of pebble tools classified into A, B and C groups on the basis of patina and state of wear and found associated, in B and C groups, with flakes. Found in the same T-1 but at separate localities, is the handaxe complex of handaxes, cores and flakes.
3. T-2: the lower deposit of 'Potwar basal gravel' with Late Sohan A industry (pebble tools associated with a greater number of flakes including Levallois flakes or flakes obtained by 'prepared core technique'); the upper deposit of 'Potwar loess' with Late Sohan B industry (mainly a flake and blade industry).
4. T-3: 'Redeposited Potwar silt' with evidence of a mixed pebble tool and handaxe assemblage called 'Chauntra Industry' after the name of the place where it was found. This is the only site where such a mixed assemblage has been found.
5. T-4: 'pink silt, sand, gravel' with 'Evolved Sohan' industry. Found at Dhok Pathan, this industry contains pebble tools, discoidal cores and flakes.
6. T-5: 'post-glacial silt'—no artefact reported.

In south India, three terraces were observed in the Kortalayar plain near Madras. These terraces were formed after a deposition of detrital laterite over a boulder conglomerate. No fauna was found in them but they contained palaeolithic tools. The better known sites of this region are Vadamadurai and Attirampakkam. At Vadamadurai the collected tools were divided into three groups based on patination and typology, whereas most

of the tools from Attirampakkam display a well-developed and late Acheulian industry.

D. Sen and V.D. Krishnaswami were among the Indian assistants in the Soan valley work. Both began to publish their findings from the late 1930s onwards. From the stratigraphical point of view, an important publication of this period was by K.R.U. Todd who studied the palaeolithic industries of Bombay in 1932 and 1939. The section published by him in 1939 shows the succession of bedrock, lower clay, lower gravel, middle clay, upper gravel and upper clay. The lower clay is devoid of tools but the reddish-brown lower gravel contained handaxes of presumably early type. On top of this gravel he found fine, developed handaxes in association with flake implements. This gravel bed suggested pluvial conditions to him. The overlying 'middle clay' suggested 'the setting in of milder conditions', and although no tool was found within it, a blade industry including cores, blades and scrapers was found on top of this clay. The upper gravel itself did not apparently show any industry but on its top lay a working site of blade-and-burin industry. The upper clay contained 'a more developed blade and burin industry', and finally, a microlithic industry appeared. In the 1940s, H.D. Sankalia observed the sequence of prehistoric industries in Gujarat which was noticed much earlier by Foote; this was also the time when D. Sen reported the occurrence of a palaeolithic industry in the lateritic conglomerate of Mayurbhanj in Orissa. The available knowledge about prehistoric India was assessed by V.D. Krishnaswami, the newly appointed 'prehistorian' of the Archaeological Survey of India, in the third issue of its official organ, *Ancient India*, in January 1947. This was the beginning of palaeolithic research in independent India.[3]

In retrospect, the foundations of this research in post-1947 India were fundamentally laid down in the 1930s and 1940s. Some of the basic features of palaeolithic research in independent India—the succession of lower gravel–lower clay and upper gravel–upper clay deposits, the equation of the gravels with pluvial conditions, the equation of the deposits of clay/silt with drier conditions, the finding of tool-bearing terraces in the Siwaliks, the percentage calculation of chopper–chopping and biface elements, etc.—can be found in the writings published in the 1930s and 1940s. It is through them that the earlier research of Foote and his contemporaries were integrated into the main framework of knowledge about prehistoric India.

At the invitation of the Government of India, F.E. Zeuner of the Institute of Archaeology, London, visited India in 1949 'to explore the possibilities of developing research in the prehistory and geochronology of

India'. He was assisted in the field by a number of people from the Archaeological Survey and the Deccan College. A number of publications ensued, and to assess this research work as a whole, one has to refer to the publication of H.D. Sankalia's *Prehistory and Protohistory in India and Pakistan* in 1963. First, the Terra–Paterson work in the Soan valley was extended to the Sirsa and Beas–Banganga valleys in the Himalayan foothills by building up a sequence of palaeolith-bearing terraces. In the river valleys of the Peninsular block, the emphasis was on building up a wet–dry succession of gravel and silt. A few new areas, such as Malwa, Rajasthan and Andhra, came in for detailed investigation, mostly by Sankalia's own students. One should also mention the publication of a monograph on the prehistoric excavations in Mayurbhanj, Orissa, by N.K. Bose and D. Sen of Calcutta University in 1948, and the work in the Singrauli valley in the Vindhyan area of Uttar Pradesh by V.D. Krishnaswami and K.V. Soundararajan of the Archaeological Survey in 1951. However, the palaeolithic studies of this period were still overshadowed by speculations regarding the distribution of handaxe elements and the so-called Sohan-type tools made on pebbles. The occurrences of a middle palaeolithic flake-blade industry and upper palaeolithic blade-and-burin industry should have been clear from the Cammiade–Burkitt work in Andhra and Todd's work in Bombay. Although Krishnaswami in 1953 drew attention to the significance of these earlier findings, Sankalia tended to miss this significance and dwelt only on the middle palaeolithic or what he called in the 1963 publication 'Middle Stone Age'.[4]

The second edition of Sankalia's *The Prehistory and Protohistory of India and Pakistan* was published in 1974. The list of the areas with lower, middle and upper palaeolithic tools in this book shows a major geographical expansion of the subcontinental palaeolithic studies, virtually all of it in modern India, thanks to the initiative taken by Sankalia and his Ph.D. students. Interestingly, what could have been a breakthrough in the establishment of the early antiquity of palaeolithic tools in the subcontinent was not properly pursued either in this or in the later period. Sankalia's discovery of a massive flake in the Second Glacial Boulder Conglomerate deposit of the Liddar valley at Pahalgam in Kashmir and his preference to put this flake in the earlier First Interglacial context[5] were not borne out by the subsequent investigation of R.V. Joshi and others who, in 1974, put the Pahalgam and related Boulder Conglomerate deposit and its stone tools only in the middle Pleistocene.[6] That theirs was not the last word on the date of palaeoliths in this region has been suggested by the two plus million years ago (mya) dating of tools in the Potwar plateau, Jammu and Ladakh. Among the other new researches of the period one may mention those in Singhbhum and

West Bengal, Orissa beyond Mayurbhanj and new areas in Maharashtra, Karnataka, Madhya Pradesh, Gujarat, Andhra and Uttar Pradesh. The three-fold stratigraphic and typological classification of the palaeolithic period into three successive periods of lower, middle and upper palaeolithic was by then consolidated, with the most important evidence of the upper palaeolithic coming from the Kurnool caves and elsewhere in Andhra, the Belan valley of Uttar Pradesh and the site of Patne in the Chalisgaon area of Maharashtra. Further, in an appendix to his volume Sankalia could list a handful of radiocarbon dates from the middle palaeolithic contexts. In one sense, these two books by Sankalia show that there was considerable progress in Indian palaeolithic research between 1963 and 1974, especially in the areas of stratigraphy and typology. The stratigraphic and typological continuity between the three horizons of the Indian palaeolithic could no longer be doubted, and there was certainly a better grip over the typological range of the tools themselves. At the same time, it has to be noted that within the range of the Indian lower palaeolithic no acceptable evolutionary sequence of tool-types emerged. A.P. Khatri's claim of an Oldowan-type pebble tool element at the base of the Narmada valley palaeolithic succession and A.K. Ghosh's claim of an Abbevillian to Acheulian type of handaxe succession in Singhbhum in south Bihar could not be given a sound basis. In a different form Khatri's claim has been rejuvenated in the context of later excavations in the Durkadi stream area of the Narmada valley, but Ghosh's picture in Singhbhum was doubted by Sankalia himself and has had no support since then.

Since the mid-seventies palaeolithic research in India has branched out in several directions beyond stratigraphical and typological considerations. First, a few traces of primary occupation of palaeolithic people have been exposed through controlled excavations at Paisra in Bihar, Bhimbetka in Madhya Pradesh and Hunsgi in Karnataka. However, none of these excavations yielded any sign of organic material which could be used for a fuller reconstruction of the contemporary life. Second, there has been some emphasis on working out the geochronology of lower palaeolithic and middle palaeolithic horizons. Admittedly, the dates available are still very limited in number, and at least in one case the dates have not contributed to a clear picture. However, the availability of some absolute dates for the Indian lower palaeolithic and a handful of non-radiocarbon dates from the middle and upper palaeolithic as well, must be considered an important step forward. Along with this has developed a concern for geoarchaeology and a quest for precision in the typological analysis of tool assemblages. Both these developments are very welcome, but as far as geoarchaeology is concerned, the use of geological and geomorphological jargon and the

presentation of archaeological data in various computer-derived forms do not necessarily announce the maturity of geoarchaeological approach to palaeolithic studies in India. Rigorous multi-disciplinary investigations in the field of sediment deposits have been conducted in a rather limited area in Rajasthan. Some amount of sea-level studies have been conducted in Gujarat. In both cases the archaeological correlates are clear. In the case of Kashmir, which has seen extensive multi-disciplinary palaeoclimatic investigations, the archaeological correlates seem to be elusive before the upper palaeolithic stage. A study of this kind was also undertaken in the context of the Son valley in Madhya Pradesh and the Belan valley of Uttar Pradesh. Under the circumstances, what has been really successful in the field of palaeolithic studies in modern India is the development of an ethnography-based settlement–subsistence approach. This has been applied with success in Andhra and Karnataka, and may be pursued in other areas as well. The core of this approach lies in enunciating the possible ways of exploiting the foodresources available in the wild on the model of the local hunter-gatherers and even peasants and trying to explain the distribution of sites in the study area on that basis. Obviously, this approach has great possibilities in a country like India where subsistence behaviour on various levels can still be observed. This type of study can be undertaken by archaeologists without a large outlay of resources and personnel which the multi-disciplinary investigations require.

The aim of this brief research review of the palaeolithic context was to offer a generalized academic perspective of the various types of research which have been conducted in this field. For the period before 1974 some detailed discussion was needed to show how much of the modern research is rooted in that period, especially in the writings of Cammiade and Burkitt, de Terra and Paterson, and Todd. The rest of this chapter will be devoted to a study of the post-1974 situation.[7]

## Skeletal Evidence[8]

Till 5 December 1982, there was no unequivocal evidence of the occurrence of a true hominid fossil from anywhere in the subcontinent. This contrasted sharply with the number of such finds in eastern and southern Africa, Europe and parts of Asia, including China, and Java in Indonesia. The discovery of such a fossil at Hathnora in the Narmada valley by Arun Sonakia of the Geological Survey of India on that date put the subcontinent on the global map of hominid fossil finds, but it is still a lone find and not everything related to it is beyond dispute.

The specimen in question is a completely fossilized, undistorted cranial

vault, dark brown to grey in colour and nearly complete except for the left supra-orbital, a part of the left parietal and occipital bones. Basically, it is the right half of the skull cap with a little of the left parietal attached to it and with parts of the orbit, eye-brow ridge and the occipital region preserved. According to Sonakia, the estimated cranial capacity is nearly 1260 cc and the specimen possibly belonged to a male. The locality of discovery is the northern bank of the Narmada river, about 200 m to the west of the modern village of Hathnora, about 40 km to the east of Hoshangabad in Madhya Pradesh. The specimen was found deeply embedded in the uppermost layer of the 3 m thick basal conglomerate horizon of this sequence. It is now in the custody of the Geological Survey of India.

TABLE II.2

*The Stratigraphy of the Hathnora Locality on the Narmada*

(after Sonakia, 1986)

| Period | Soil Type | Thickness of Soil |
|---|---|---|
| Upper Pleistocene to Holocene | black cotton soil—grey silty sand | 2 m thick |
| Middle to Upper Pleistocene | yellowish to brownish silty clay with thin inconsistent pebble beds (comprising quartzites and chert), profuse calcareous nodules and lime concretions with mammalian fossils and stone implements | 11 m thick |
| | pinkish silty clay with lime concretions | 2 m thick |
| | fairly hard compact and cemented gravel and conglomerate comprising pebbles of quartzite, sandstone, chert, chalcedony, jasper and agate with hominid and other mammalian fossils, and stone implements (heavy handaxes with sharp edges) | 3 m thick |
| ---------- Unconformity ---------- | | |
| Bedrock of Deccan Trap | | |

According to the initial report by Sonakia, the Hathnora specimen dates from the Middle Pleistocene and belongs to the *Homo erectus* variety of

hominid fossils. However, he adds that 'it differs from all the known subspecies of *H. erectus* in having comparatively larger cranial capacity (1260 cc), higher vault and mental eminence.' He further suggests that the Narmada Man 'appears to represent an advanced stage of *H. erectus*'.

More observations on the stratigraphic position of the find were available from G.L. Badam and others in 1986. There is a 1.5 m thick cemented, sandy, pebbly gravel at the base. This is unconformably overlain by a 0.5 m thick cemented, sandy, pebbly gravel. The skull cap has been found in this gravel along with a good number of vertebrate fossils consisting of *proboscideans* and *bovids*. This gravel also yielded a few late Acheulian tools. This grades into an overlying, *c.* 5 m thick unconsolidated, sandy, pebbly gravel with middle palaeolithic and a few late Acheulian tools. The overlying *c.* 2 m thick bed of pebbly–cobbly silty clay with calc-nodules contains only middle palaeolithic tools. Overlying this is a *c.* 4 m thick yellow silty clay, itself overlain by the black cotton soil of the region.

On the basis of the archaeological investigations at fossil hominid site of Hathnora, and the close similarity of the associated tools with other Late Acheulian complexes in and outside India, the age assigned to the culture and the fossil skull cap is late Middle Pleistocene to early Late Pleistocene. However, it would be premature to comment on the phylogenetic position of the hominid at this stage. But the findings of archaic *Homo sapiens* in association with Late Acheulian complexes outside India . . . necessitate a critical reinvestigation into the identification of *Homo erectus narmadensis*.

In the above-mentioned publication by Badam and others in 1986 one senses a controversy regarding the evolutionary status of the Narmada skull: *Homo erectus* or Archaic *Homo sapiens*? However, the balance of current opinion seems to favour the latter position. K.A.R. Kennedy published a detailed formulation of this viewpoint in 1992, with an earlier statement made along with Sonakia and others in 1991. In addition to the morphometric details offered by him, there are some changes from the initial observations by Sonakia: the age of the specimen is in the range of 27 to 32 years, 30 being an acceptable estimate; it is a female skull and its cranial capacity is in the range of 1155 to 1421 cc, 'values which are high for African and Asian *Homo erectus* but closer to ranges for *Homo sapiens*'. Further, following the traditional method of comparing the morphometric data of the specimen with traits held to be diagnostic of established fossil series and seeking a multivariate statistical method using a larger comparative specimens series, Kennedy (1992) reaches the following conclusion:

We conclude that employment of the Bayes factor in this multivariate analysis erodes the initial confidence in assignment of Narmada Man to the taxon *Homo erectus*. This confirms the independent results of our morphometric univariate analysis. That Narmada Man does not fit easily within the suite of morphometric characters of Asian *Homo erectus* is correlated with the extremely high incidence of characters that are found in middle Pleistocene hominid specimens variously labelled as 'archaic' *Homo sapiens*, pre-Neanderthals and ante-Neanderthals.

In 1995, Badam gave out the fluorine/phosphate ratio of the Hathnora skull as 7.53 which, according to him, lent substance to his dating of the specimen in 'late middle Pleistocene'. However, considering that the middle Pleistocene is currently assumed to have lasted from 900,000 to 127,000 years ago, this is not a focussed date. Another opinion, that the Narmada Pleistocene column as a whole falls within the geomagnetic polarity epoch known as 'Brunhes chron' which began about 780,000 years ago, does not also help to get a more focussed idea of the skull's chronology.

Interestingly, Badam also raises doubt regarding the *in situ* position of the find by arguing that its position in a channel bar environment at Hathnora 'combined with taphonomic features indicate that the cranium was redeposited in this section after having been transported over some distance. However, it must be pointed out that the initial characterization of the skull as *Homo erectus* by Sonakia was fully supported by the French scientist M-A. de Lumley and her colleagues on the basis of their univariate and morphometric analysis. More recently, a hominid clavicle or collar-bone has been reported from Hathnora by the Anthropological Survey of India.

## The Earliest Dates of Palaeolithic Tools in the Subcontinent[9]

Since the advent of radiocarbon dating in India many radiocarbon dates of the later palaeolithic industries have been obtained. It is only comparatively recently that the dating techniques able to cope with the vast timespan of the early palaeolithic have been used, although on a very limited scale. In their earliest limits, some of the dates have been fascinating and raise issues regarding India's position in the geographical scheme of human evolution. The tool sequence beginning 2.6 mya in east Africa is well known and accompanies many related, earlier and later hominid fossil finds. What is directly relevant to the Indian context is not so much the African evidence but the evidence emerging from Indonesia and China. In the case of Java in Indonesia several hominid remains have been recently

dated between 1.8 and 1.6 mya, thus putting an end to all doubts regarding the early dates of the Javanese finds. In China, although the famous Zhoukoudian finds near Beijing are dated from the baseline of 5,00,000 years ago onwards, the age of 1.7–1.9 mya for a fossil skull find and associated stone tools from the Longgupo cave in Sichuan is a very important development. It would only be prudent to make inquiries into the earliest dates suggested for the Indian palaeolithic tools.

The first Indian publications in this regard date from 1975 and 1977 and deal with the Siwalik region. Geologically, the Upper Siwalik formations comprise, successively, the Tatrot and Pinjor zones. Here, among other things, the problem is to place the boundary between the Pliocene and the Pleistocene. According to R.K. Ganjoo in 1990, on the basis of magnetic polarity, this boundary lies within Pinjor at 1.8 mya and 'therefore the basal part of the Pinjor is of late Pliocene age'. Archaeologically, what is significant is that in 1975 B.C. Verma of the Geological Survey of India reported *in situ* artefacts and associated fossils from the base of Pinjor. In 1977, J.C. Sharma of Chandigarh University discovered numerous stone implements in the Lower Boulder Conglomerate above Pinjor, which B.C. Verma in 1984 placed in the Lower Pleistocene. While reporting his finds, Sharma was sure that the Boulder Conglomerate stage of the Upper Siwaliks belonged to the middle Pleistocene and possibly to the early Pleistocene. In fact, he cited a geological opinion to the effect that the Lower Boulder Conglomerate stage could indeed be dated to the lower Pleistocene. The chronological implications of these finds, especially the one made by Verma in 1975 at the base of Pinjor, are obvious. In 1984, Verma further reported a chopper tool of quartzite pebble located *in situ* in a red clay band in the Tatrot horizon to the north of the Siwalik Fossil Park at Suketi in Himachal Pradesh. In this publication he draws attention to the existence of 'numerous early palaeolithic artefact-bearing sites' in the outer Siwalik belt and in the Markanda river valley of Sirmur district, Himachal Pradesh. Moreover, he argued that 'the earlier concept of linking the artefacts found in the Outer Siwalik Belt with different levels of the terraces' did not hold 'convincing ground'. In view of the later developments in the Potwar plateau in the Pakistani Punjab, which have led to the rejection of de Terra's idea of terrace-bound occurrence of stone tools in the Soan valley, Verma's statement shows that some Indian geologists also were sceptical of the veracity of de Terra's terrace-bound lithic succession.

In any case, it is clear that there was a slow but steady accumulation of data on the early or pre-middle Pleistocene tools in the Indian Siwaliks from 1975 onwards. In 1991, Verma further drew attention to a site called Uttarbaini in the Jammu area, which yielded early palaeolithic artefacts

from below a tuffaceous ash bed in the Upper Siwaliks. In 1988, this bed was dated to 2.8 ± 0.5 mya by A. Ranga Rao of the Oil and Natural Gas Commission, and others. There have been claims of palaeolithic finds in the lower Pleistocene stage from Ladakh as well.

Clear evidence has emerged from the Siwalik section of the Potwar plateau in Pakistani Punjab where Helen Rendell's geomorphological work buttressed by archaeological surveys and dating has done away with de Terra's earlier scaffolding of Pleistocene events in the region. The crucial site in the present context is Riwat, south-east of Rawalpindi. Here a limited number of indisputably flaked artefacts (at least two) were found embedded in a gritstone conglomerate with about 70 m of deposit above it. The geological context of this conglomerate was within the folded strata of a formation known as 'Soan syncline'. Palaeomagnetic dating of this context was at 2.01 mya and thus the embedded artefacts also are 2 million years old. This was published in 1988 and 1989. The subsequent related evidence has emerged from the Pabbi hills which lie to the east of Jhelum. The Pabbi hills lithic assemblage does not show any handaxe or cleaver and seems in this sense to be pre-Acheulian: the artefacts found 'tend to be very simple, and are predominantly flaked pebbles, cortical flakes, disc cores and flakes with < 25 per cent of their cortex remaining'. The *absence* of formal tool types has been specifically commented on. This assemblage was collected from the erosional surfaces of fossil horizons of 1.2 and 2 mya. The implications of this find are obvious and agree well with those of the Riwat find.

TABLE II.3

*The Siwalik and Post-Siwalik Stratigraphy of the Potwar Plateau*

(after Rendell, 1984)

| Depositional units in the Soan valley | Dates (in million years) |
|---|---|
| Loess | |
| ---------- disconformity/warping---------- | |
| Lei Conglomerate, including loess horizons | |
| ---------- unconformity ---------- | 0.5–0.7 |
| Upper Siwalik Conglomerates | 1.9 |
| Pinjor beds / Tatrot beds } Soan formation | 2.5 |
| ---------- disconformity---------- | 3 |
| The early Siwalik beds | |

Another area which has emerged into the limelight in the present context is the Kukdi river valley in the Pune area of Maharashtra. There are eight volcanic ash exposures for a stretch of about 8 km near the village of Bori. Palaeolithic artefacts, which include handaxes, flakes and choppers, are mostly found in a gravel which cuts into the ash bed at a number of sections. Sheila Mishra and her associates have studied the sections in detail and reached the conclusion that 'the dating of the tephra gives us a date for the gravel and the Acheulian assemblage found in it', because the tephra and the gravel are both underlain and overlain by the same unit. In 1988, preliminary attempts to date the tephra or the volcanic ash bed from the sections 1 and 3 of the area by using Potassiam–Argon dating method on the total material yielded a mean age of 1.38 ± 0.24 mya. However, the adoption of more rigorous techniques led to the mean age of the Bori tephra being established as 0.67 ± 0.03 mya. This is not early Pleistocene and earlier, as in the case of the Indian Siwaliks, Riwat and the Pabbi hills, but if this dating is universally accepted, the Acheulian industry in the Deccan can be taken to date from early middle Pleistocene. Another important point to consider is that two flakes have been recovered in two separate sections at Bori from the sediments underlying the tephra. Thus, the date given here denotes only a minimum for the early palaeolithic occupation of the area.

The problem regarding the Bori date is not yet over. Another Potassium–Argon date from Bori by a different research group puts it at 538,000 years ago. Further, P. Shane and others have rigorously analysed the trace elements of the Bori tephra and this closely matches the trace element pattern of the youngest tephra deposit from Toba in Indonesia, which falls around only 75,000 years ago! The debate may not yet be over, but the very fact of this debate has highlighted the possibility of the early occurrence of palaeolithic artefacts in the interior of the subcontinent away from the Siwalik zone.

## Distribution, Stratigraphy, Climate

### *Preliminary Issues*

Three issues need clarification before embarking on a review of regional distribution of sites, their stratigraphy and their climatic background. First, the succession of the lower, middle and upper palaeolithic is clear from the stratigraphic profiles obtained from different regions; second, in each case there are some distinct typological features of these successions. Both these points have long been known; in fact, as noted earlier, these three stratigraphically and typologically valid distinctions of the Indian

palaeolithic were realized as early as 1930 by Cammiade and Burkitt and somewhat later by Todd. Subsequent explorations all over the relevant areas of the subcontinent have amply highlighted the validity of these distinctions and added considerable local and regional details to them.

Notwithstanding this development, it is important to note that problems related to such distinctions are not yet over. For instance, in the case of the Nevasa area in the Pravara valley, a tributary system of the Godavari, a recent opinion brackets the lower and middle palaeolithic components of the local stratigraphical profile together, arguing that the flake component of the middle palaeolithic could represent the light-duty facies of the early palaeolithic and that the usual heavy-duty component of the Nevasa Acheulian assemblage got disintegrated because these implements were fashioned out of basalt, an easily disintegrating stone. Further, the sorting by fluvial agencies could have been a contributing factor to the situation where the Acheulian implements are absent in the 'middle palaeolithic' context at Nevasa. Problems of this kind seem to have been best expressed by M.A.J. Williams and M.F. Clarke in the context of the Son and Belan valleys where three gravels were earlier identified in ascending stratigraphic order:

> It was also very rare to find all three gravels in a single stratigraphic section, and field inspection of particular gravels soon revealed that they were highly complex, with substantial vertical and lateral facies variations, making it increasingly difficult for the stratigrapher to accept that there were only three gravels. Little further progress seemed possible until the gravel chronology had been replaced by an alluvial stratigraphy defined and dated independently of the archaeology, and based upon accepted tenets of stratigraphic mapping.[10]

Such problems are best left to geomorphologists to sort out, and it appears for the present that it is too early to discard the usual stratigraphic and typological divisions of the Indian palaeolithic into lower, middle and upper.

Such distinctions do not, of course, mean that the Acheulian tool-types based on pebbles and cores do not continue in the middle palaeolithic level; they do, but the basic distinctive feature of the latter assemblage is an emphasis on flakes. Similarly, the distinctive feature of the upper palaeolithic is a blade-and-burin industry or an industry primarily based on flakes and blades. In 1973, A.K. Ghosh pointed out that the palaeolithic culture complex of India might broadly be divided into three basic chrono-cultural elements: pebble-core, flake and flake-blade elements. According to him 'the terms are based on culture–traditional units placed in the sequential framework, both geological and archaeological. The whole

scheme broadly has an all-India character, though of course at places regional variations are marked.'[11] In 1974 Sankalia designated the principal tool components of the middle palaeolithic as scrapers, points and borers, whereas the distinctive feature of the upper palaeolithic was a blade-and-burin industry.[12] At the same time, it is important to mention here that the cultural validity of the three-fold stratigraphic division between the lower, middle and upper palaeolith is increasingly being questioned in the palaeolithic literature outside India. What Clive Gamble proposed in the European context, i.e. a distinction between a pre-35 thousand years ago (ka) as *early* palaeolithic and a *late* palaeolithic after that date, has been advocated in the context of the Potwar plateau by Rendell, Dennell and Halim:

> The Early Palaeolithic in the Soan and the Potwar is defined in this study simply as being earlier than 30,000 BP; it cannot at present be sub-divided into chronological stages defined by the presence or absence of certain items such as (Acheulian) handaxes, and (Levallois–Mousterian) tortoise- and disc-cores. What is clearly needed are examples of these items in secure geological contexts that are amenable to absolute dating.[13]

However, the important thing here is the availability of well-dated contexts. Till such contexts are reasonably plentiful in various parts of the subcontinent, it may be less confusing to stick to the labels of the lower, middle and upper palaeolithic.

Another point to note here is that the transition from one stage to another was not sudden. Where clear stratigraphic profiles are available, a clear evolution of the lithic industry undergoing transformations from the lower to the middle palaeolithic and from the middle to the upper palaeolithic, are noticeable. What is equally noticeable is a gradual change in the preference for raw materials: quartzite and similar material in the lower palaeolithic, and fine-grained stone varieties in the middle and upper palaeolithic. The varieties of available tool types considerably increase from the lower to the middle palaeolithic, and again, there is a sharp increase in the variety of tools from the middle to the upper palaeolithic. These general assertions notwithstanding, one need not postulate simple, uni-directional changes through time in the palaeolithic assemblages. The study of inter-assemblage variability within a given period does not support the premise of uni-directional changes.

As long as one can examine the regional and local stratigraphical profiles there is no difficulty in assigning *in situ* artefacts to their positions in the palaeolithic succession. The problem begins when one encounters surface assemblages, i.e. an assortment of tools lying on the surface in the ground. The distinctive tool types of one stage may also occur in the next, and it is a

bold man who can assign a scraper or a group of scrapers and borers found on the surface straight to the middle palaeolithic stage. They can also occur in the next stage, i.e. the upper palaeolithic stage. One also encounters amorphous tool assemblages combining both early and late tool-types; in such cases the best thing perhaps is to judge the industry by its latest tool-type. If such an amorphous assemblage contains blades and burins, it will perhaps be more logical to assign them to the upper palaeolithic.

Our third issue in the present context is related to the methods of the study of palaeoclimates.[14] Temperature, rainfall and humidity—the basic parameters of climate—leave behind their historical records in various living and non-living materials. Trees, ice-cores, lakes, coastal and ocean deposits preserve records of shorter duration (from a few centuries to a few thousand years) whereas deep-sea deposits and continental rocks contain the climatic story up to several million years ago. The methods of dating the relevant geological samples and placing them in a chronological order are many but the most common ones are based on the decay of radio-isotopes. The range of applicability is dependent on the half-life of the isotope concerned and the sensitivity of the instrument to measure it. Some well-known radioisotopic methods are $^{14}C$, K-Ar, $^{39}Ar$-$^{40}Ar$, $^{238}U$, $^{10}Be$ and $^{230}Th$ methods. In some cases age is directly calculated whereas in some others the rate of deposition has to be calculated first. Physical and chemical methods include thermoluminiscence (TL), Electron Spin Resonance (ESR), magnetic reversals and a method based on the racemization of the amino acid isoleucine. Unlike the TL, ESR and racemization methods where one can obtain the ages, plot them and obtain deposition rates, the magnetic reversal technique needs a continuous deposit to detect polarity changes in the earth's magnetic field as recorded by samples which are known to have occurred during the following periods:

TABLE II.4

*Polarity Changes in the Earth's Magnetic Field*

(after Somayajulu, 1990)

| Periods (mya) | Polarity | Event |
|---|---|---|
| 0–0.72 | normal | Brunhes |
| 0.72–2.14 | reverse | Matuyama |
| 0.91–0.97 | normal | Jaramillo (Matuyama) |
| 1.66–1.87 | normal | Olduvai (Matuyama) |
| 2.01–2.04 | normal | Reunion (Matuyama) |

Once these events are detected in chronological order in a sedimentary column, it is possible to assign ages to the corresponding depths and cal-

culate the deposition rates. Radioisotopic $^{210}Pb$ technique has been successfully used to date lake and coastal sediments related to the climate of the past century. Geochemistry plays a leading role in reaching the isotope levels of many of the elements which in the present context hold clues to climates. The fields of study are related to mineralogy, elemental composition, isotopic studies, marine sediments and trees.

At this point we should also consider the issue of Neogene-Quaternary boundary or the Pliocene–Pleistocene boundary in the Indian context. Neogene means the geological ages of Miocene and Pliocene and Quaternary means Pleistocene and Recent. So it is an issue of dating the Plio-Pleistocene boundary in India. In the context of the subcontinent the areas which have drawn detailed studies in this regard are the Siwalik beds of the outer Himalayas and the Karewa beds of Kashmir. The Siwalik beds have been studied for a long time whereas the Karewa situation has been examined in detail in recent years. Both these beds show thick sedimentary profiles and thus it is easier to study the problem here than elsewhere. The thick Siwalik section has been subdivided into Lower, Middle and Upper Siwaliks. The Lower and Middle Siwaliks are entirely Pliocene, with the topmost zone, Dhok Pathan, marking the end of the Middle Siwaliks. The Upper Siwaliks comprise, successively, Tatrot, Pinjor and Boulder Conglomerate. The problem seems to lie in determining if the Neogene–Quaternary transition can be put at the base of Pinjor or at the base of Boulder Conglomerate or even within Pinjor. Following D.P. Agrawal, we shall accept the opinion that this boundary in the Siwaliks should be placed at the Tatrot–Pinjor transition of about 2.4 mya, coinciding with the transition to the Matuyama phase in the history of changes in the magnetic polarity of the earth's field. The change of Tatrot fauna into Pinjor fauna took place at this point and the argument is based on the simultaneous appearance of *Equus*, *Elephas*, *Bos* and *Cervids* with antlers. Agrawal also puts the N/Q boundary in the Karewa deposits of Kashmir at the Matuyama transition.[15]

## *Regional Survey*

In the extreme north-west, the Sanghao cave at the edge of the Peshawar plain in the North Western Frontier Province of Pakistan has yielded evidence of middle to upper palaeolithic occupation, but lower palaeolithic is still unreported in this region. We have already drawn attention to the finds from the Soan valley and the Pabbi hills in the Potwar plateau section of Pakistani Punjab and further noticed that its post-Siwalik stratigraphy is dominated by the Lei conglomerate and loess deposits. The earlier Siwalik strata were eroded, and the quartzite cobbles derived from this process of erosion formed the first post-Siwalik deposit of the Lei Conglomerate.

Then, after the formation of a layer by colluvial deposition, the sequence is dominated entirely by the deposition of loess, the oldest level of which perhaps reaches 170 ka. Between 130 ka and 75 ka loess is preserved in isolated pockets, but its deposition and preservation were widespread between 75 ka and 18 ka. Loess is basically a wind-blown silt material, and in this case its source has been presumed to be local, within 100–200 km. The whole phase of loess deposition may here be associated with locally drier periods and weaker monsoonal circulation. It has been inferred that the south-west monsoon penetrated this area only after 18 ka in the late Pleistocene.This picture is said to be corroborated by the work on Indian Ocean sediments which shows wetter conditions after 18 ka. Environmental information seems to be tentative for the pre-loess stage, but the upper Siwalik strata in this area have been supposed to connote the existence of a floodplain zone, peripheral to major channels.

In Sind, the distribution of such sites is conditioned by the locations of the outliers of the Kirthar range, Milestone 101 and the Sukkur-Rorhi hills being the two well-known centres of palaeolithic distribution here. Only surface occurrences have been noted but they cover the whole range of the palaeolithic from the lower to the upper. The Rorhi hills provide a good source of the raw material used for making palaeolithic implements, and on the basis of the study of the Acheulian workshop site of Ziarat Pir Shaban it has been inferred that it was used for the manufacture of handaxes which were later taken to the (contemporary) Acheulian base-camps. Occurrence of palaeoliths has also been reported in the Las Bela plain to the west of Karachi, and although the report is not very specific, both lower and middle palaeolithic materials are said to be represented.[16] Since the earlier reports of lower palaeolithic artefacts from the Pahalgam sector, only upper palaeoliths have been reported from Kashmir. Considering that Ladakh has lower palaeolithic sites, there is no reason why they should not occur in Kashmir. The Kashmir upper palaeolithic has been placed around 18,000 BP and thus it coincides with a phase of climatic amelioration or warming. There is apparently an extensive literature on the loess-palaeosol sequences of the Kashmir valley, but till we get well-defined archaeological correlates, such literature does not have any archaeological significance.

The palaeolithic evidence is more explicit and widespread in the Indian Siwalik belt from Jammu to Kangra and the lower areas of Himachal Pradesh and Punjab. There have been terrace-related studies of the relevant finds in the Beas-Banganga valley of Kangra and the Nalagarh-Chandigarh area of Punjab, but in view of the fact that such terrace-related studies have been discarded in the Soan valley, which provided the model of such studies in the Indian Siwaliks, no emphasis may now be put on the imple-

mentiferous 'terraces' of the Beas-Banganga and other valleys. Perhaps a more useful approach will be to study the implementiferous occurrences of this region in terms of the basic Siwalik stratigraphy. The tremendous significance of the Siwalik sediments, 'the thickest and most complete known Neogene sequence of fluvial deposits and palaeosols', has recently been extensively commented upon.[17]

TABLE II.5

*The Palaeoclimatic Sequence of Kashmir*

(after Agrawal, 1992)

| | |
|---|---|
| Up to 3.8 mya | warm temperate. |
| 3.7 mya to 2.6 mya | transition from 'sub-tropical' type to 'cool temperate' type. |
| Up to 2 mya | cool temperate with some variation in precipitation. |
| The last 200 ka | loess deposit–10 palaeosols (i.e. old soil deposits) during this period, with three of them showing greater weathering and thus suggesting warmer/humid conditions compared to the others. |
| The last 17 ka | a few pollen profiles: around 17 ka there was a warming of the valley; between 10,000 (years) Before Present (BP) and the present the pollen profiles show a cool temperate-warm temperate–cool temperate cycle. |

There is an extensive spread of palaeolithic material in Rajasthan on either side of the Aravallis which also contain palaeolithic material as far north-east as Haryana and Delhi. In east Rajasthan the major work was done by V.N. Misra in the Berach valley and its tributary valleys of the Gambhiri, Wagan and Kadamli, leading to the establishment of the following general stratigraphy:

TABLE II.6

*The Palaeolithic Sequence of the Berach Valley, Rajasthan*

(after Misra, 1967)

| | |
|---|---|
| sandy gravel | a middle palaeolithic flake industry in yellow-brown jasper, comprising a variety of scrapers, borers, points, flake-knives and a small proportion of finely worked handaxes |
| silt deposit | |
| cemented gravel | a lower palaeolithic industry, invariably of quartzite, with handaxes, cleavers, flakes, pebble choppers and both advanced and crude scrapers |
| decomposed bedrock/mottled clay | |

Around Ajmer at the edge of the desert, the lower palaeolithic material occurs in sandsheet with angular slopewash debris, which was covered by another sandsheet deposit with calcification and rootcast development between this and the earlier sandsheet deposit. The middle and upper palaeolithic material comes from buried soil which covers the later sandsheet deposit. Between this soil formation and the covering deposit which is another sandsheet formation, there is trace of calcification and rootcast development. The Hokra basin to the north-west of Ajmer showed rich middle palaeolithic working floors and upper palaeolithic working material. The middle palaeolithic was a flake industry with levallois cores or cores derived from the use of 'prepared core technique'. In the upper palaeolithic industry here one finds burins, carinated scrapers, blades and blade cores of quartz and quartzite. In the Luni valley, also in the arid zone of Rajasthan, the middle palaeolithic tool-bearing sandy gravel directly overlies bedrock and is topped, successively, by a silt and a sandy deposit. In this area lower palaeoliths also occur, although as stray finds. Middle and upper palaeoliths are found near Jaisalmer as well, although the upper palaeolithic is not as abundant as the middle palaeolithic here. On the basis of their work Bridget Allchin and her group inferred the following climatic and Stone Age sequence in the Thar desert.

TABLE II.7

*The Stone Age Sequence in the Thar Desert*

(after B. Allchin et al., 1978)

| | |
|---|---|
| Major Dry | : pre-middle palaeolithic—major aeolian deposition with *kankar* in slope wash—the presence of rolled early palaeolithic tools. |
| Major Wet | : middle palaeolithic, < 40 ka—major weathering and decalcification of dunes—the Luni with an integrated drainage—substantial human occupation. |
| Major Dry | : upper palaeolithic, pre-10 ka—dunes extending over lake basins and middle palaeolithic soils—miliolite deposited in Gujarat and river aggradation in the plains—negligible human settlements. |
| Moist | : 10–9.5 ka—pollen-rich lake sediments—fresh water gastropods near lakes—extensive microlithic settlements. |

In western Rajasthan, including the Thar desert, prehistoric research has significantly advanced in recent years under the leadership of V.N. Misra. In the Didwana area of the Nagaur district of west Rajasthan there are three major stratigraphic units, the first of which—the Jayal Formation—is a very extensive and continuous gravel ridge dating from late Tertiary–early Pleistocene and earlier than the human presence in the area. The two

successive post-Jayal Formations, separated from the Jayal Formation by a disconformity, are the Amarpura and Didwana Formations. The Amarpura Formation, as exposed in the Singhi Talav quarry near Didwana, is a strongly mottled and well-la..inated greyish silty calcareous clay, containing a rich early Acheulian material. It is a 15 to 20 m thick deposit exposed in various places and contains a succession of lower to upper palaeolithic material. Geologically, it is placed in late middle Pleistocene to late Pleistocene. The Amarpura Formation overlaps with the succeeding Didwana Formation which continues into the post-Pleistocene Holocene age. The reconstructed environmental picture shows that the Jayal Formation, which does not contain any cultural material, is a 60 m thick well-rounded pebbly–bouldery gravel, interlayered by a 2–10 m thick calcrete. It was deposited by a high-energy bed-load braided stream system and was uplifted in the form of a ridge some time during the early Pleistocene. The drainage system of the post-Jayal formations consisted of highly meandering and low-gradient streams with their wide floodplains and their associated pools and lakes. The abundance of *kankar* beds in various forms and the presence of mottling in clay loams indicate that the climate was essentially hot semi-arid throughout the long period from the middle Pleistocene to early late Pleistocene. This flowing drainage ceased to exist some time in the early part of the late Pleistocene. In fact, the terminal pleistocene in this region has been supposed to denote one of the driest climatic phases. The early Holocene was relatively wetter.

TABLE II.8
*Quaternary Stratigraphy of the Thar Desert*
(after Misra, 1995)

| *Formation* | *Dominant lithology* | *Approximate age* |
|---|---|---|
| Jayal | calcretized bouldery gravel | late Tertiary to early Pleistocene |
| | Disconformity | |
| Amarpura | calc-pans, calcretized alluvium and pedocalic palaeosols | late middle Pleistocene to late Pleistocene |
| | Overlap | |
| Didwana | stabilized aeolian sands | |
| | pedocalic palaeosols and playa sediments | late middle Pleistocene to Holocene |

A continuous cultural evolution has been traced from the early Acheulian to the middle palaeolithic in the Didwana area. The massive and thick handaxes with large unflaked areas and cleavers of convergent type

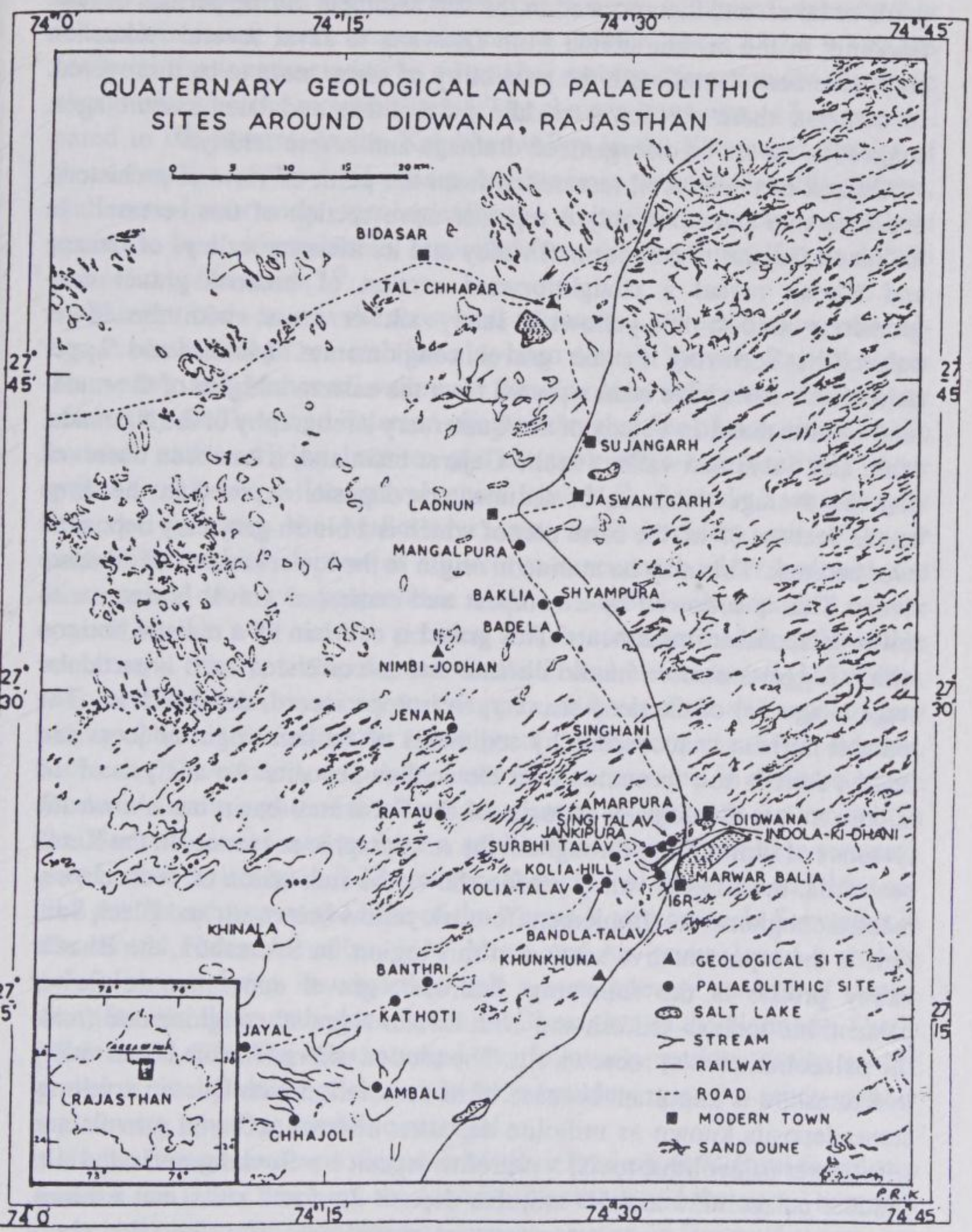



Fig. 1 Site distribution around Didwana (Misra, 1982)

with narrow working edges come from a well-defined horizon of a soft, loamy sediment at a depth of between 40 and 80 cm in the Amarpura Formation. Such tools were made, used and discarded on the banks of water pools or lakes, and incorporated in the soft sediment during periods of lake flooding. In the 50 km stretch from Didwana to Jayal several Acheulian sites have been found, with the possibility of many more to be discovered. In contrast, there are fewer middle palaeolithic and later assemblages, suggesting an era of disorganized drainage and severe aridity.[18]

Gujarat has been well researched from the point of view of prehistory, and here one can offer only a representative section of this research. In mainland Gujarat, the Sabarmati valley and its tributary valleys of Orsang and Karjan reveal a straightforward section of bedrock–gravel conglomerate–reddish silt–yellowish sandy silt or loess, with the lower palaeoliths occurring in the gravel conglomerate. Middle and upper palaeolithic tools have been reported from the eastern margins of the mainland Gujarat plain. In a study of the Quaternary stratigraphy of the Narmada, Mahi and Sabarmati valleys in the Gujarat mainland, it has been observed that the average thickness of sedimentary deposits exposed in the three basins is about 35 m, the basal part of which is a bluish-grey clay deposited over bedrock. This may be marine in origin in the lower reaches of all these rivers. This is followed by a compact and cemented gravel horizon with lower palaeolithic implements. This gravel is overlain by a red soil horizon which suggests a more humid climate and is correlated with a particular stage (stage 5e) of the deep-sea oxygen isotope record, dated 125 ka. The red soil horizon is succeeded by sediments of aeolian origin or loess and finally, there is soil formation over the aeolian deposits. An analysis of the middle to late Quaternary deposits of the Sabarmati basin has shown the presence of semi-aridity throughout the stratigraphic sequence. In the Kutch peninsula, the Bhukhi valley profile shows the succession of bedrock, cemented conglomerate (implementiferous), yellow brown silt and Black Soil. This is the representative section of this region. In Saurashtra, the Bhadar valley profile is the following: bedrock > gravel conglomerate (lower palaeolithic tools) > reddish soil with *kankar* > gravel conglomerate (middle palaeolithic tools) > brown silt. The section offered for the Hiran valley in Saurashtra is important because of its association with Quaternary limestone deposits known as miliolite deposits: bedrock > fluvial gravels and silts (lower palaeolithic tools) > miliolite deposit 1 > fluvial gravels and silts (middle palaeolithic tools) > miliolite deposit 2 > fossil soils, etc. > dunes, etc. The miliolites occur not merely in coastal Saurashtra but also about 170 m inland and this has led to an extensive literature on the origin of these deposits and their mode of deposition so far inland. The inland deposits are

generally considered wind-borne, although there are opinions to the contrary. According to N. Bhaskara, 'These deposits were formed under sea water in close proximity to where they are seen today.' In fact, the changes in the sea-levels of the Saurashtra coast have witnessed considerable research in recent years. According to one opinion, about 87.2 ± 9.7 ka the sea-level rise is estimated to be +7 m after making correction for a tectonic overthrow, whereas around 126 ± 5.7 ka the sea-level was –13 m as compared to the present. In the Kalubhar valley in the Bhavnagar district of Saurashtra the implementiferous gravel has been put in the late Pleistocene, and more importantly, 'geologically the Acheulian occurrence does not appear to be stratigraphically separated from the implementiferous middle palaeolithic formation.'[19]

The Narmada tract is the most well-researched prehistoric area of Madhya Pradesh, though research has also been done in Damoh, Raisen, Upper Son valley and Mahanadi valley. In the Narmada valley, the stratigraphy offered by de Terra and Paterson showed three cycles of deposition on the bedrock and overlying laterite: gravel > pink silt; > comparatively loose gravel > pink silt; > fine gravel > pink silt. H.D. Sankalia's stratigraphy was derived from the Maheshwar area: thick bouldery gravel (lower palaeoliths) > thick deposit of silty clay > a second boulder bed with the same types of lower palaeolithic tools > a second silt deposit > a finer gravel deposit with smaller pebbles, which contains middle palaeolithic tools > and finally, a clay deposit. Sankalia and his student S.G. Supekar, who undertook excavations in this area, did not find evidence of any stratigraphic evolution of the typology of the lower palaeolithic industry. However, G. Armand, who later undertook excavations in the area of the Durkadi stream, a part of the Narmada system, thought that the handaxe in the Narmada could evolve from a pebble base, and in this he was anticipated much earlier by A.P. Khatri, who thought that there was an Oldowan-like pebble industry at the base of the Narmada sequence. At Samnapur in the central Narmada valley, V.N. Misra and his group found a middle palaeolithic industry in what they call a semi-primary context of implementiferous rubble embedded in silt. At Bheraghat on the Narmada, Sheila Mishra and S.N. Rajaguru studied the following section: sandy pebbly gravel with Acheulian: cleaver > break > bouldery gravel > sandy pebbly gravel with upper palaeolithic material.

In the Damoh area near Sagor in Madhya Pradesh, R.V. Joshi found two gravels, the lower one with the lower palaeolithic and the upper one with the middle palaeolithic. Acheulian surface clusters in Raisen district were studied on the basis of their sizes and locations by J. Jacobson. In eastern Madhya Pradesh, R.P. Pandey has located a number of palaeolithic sites in

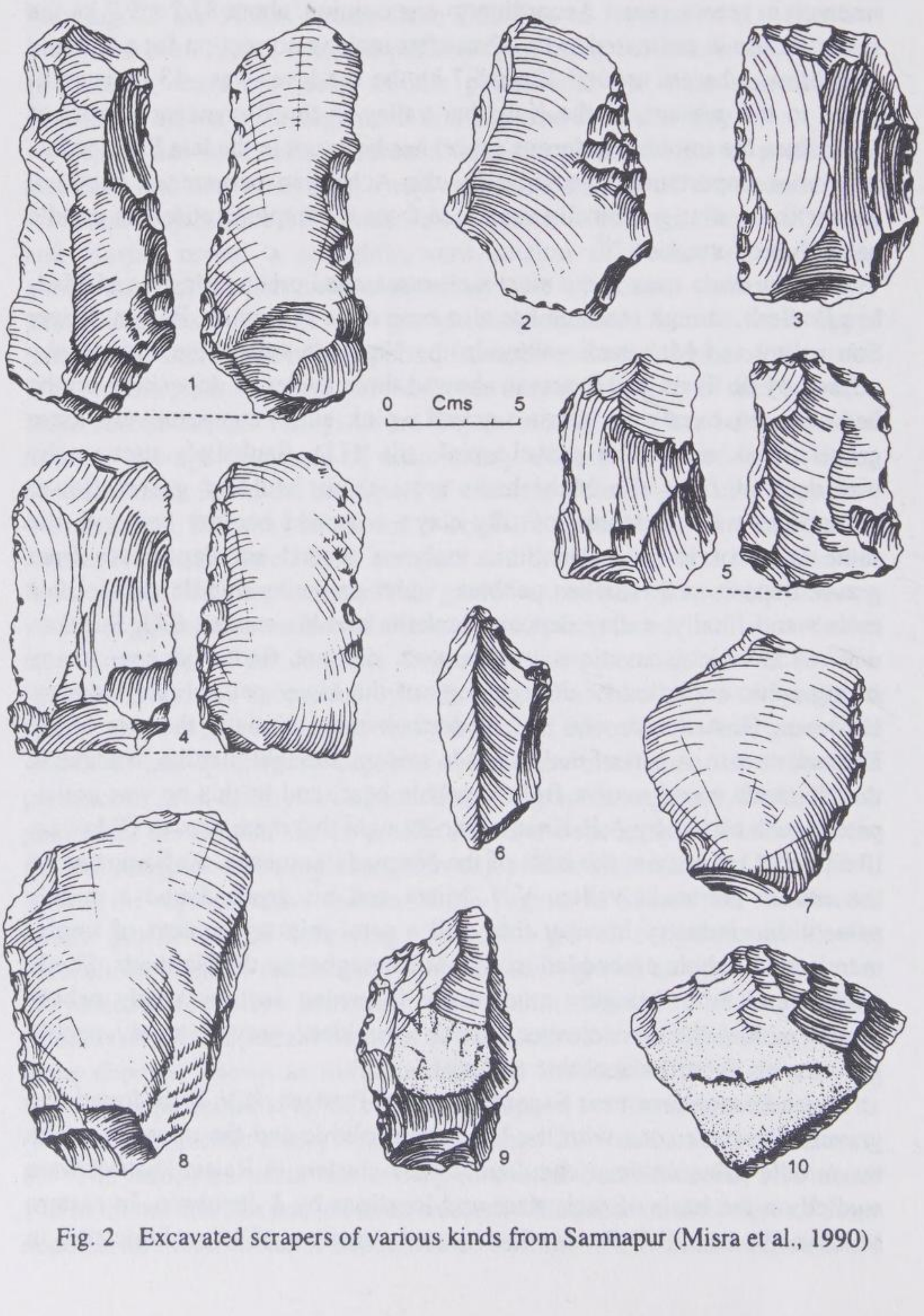



Fig. 2 Excavated scrapers of various kinds from Samnapur (Misra et al., 1990)

the Mahanadi valley. The lower palaeolithic material comes only from surface occurrences, whereas the middle palaeolithic specimens are found associated with the river gravels. The upper palaeolithic industry of the area also seems to have been derived exclusively from the surface occurrences.

The rock-shelter-rich area of Bhimbetka near Bhopal in Madhya Pradesh has yielded evidence of a continuous prehistoric occupation from the late Acheulian onwards. Out of 8 layers in the 4 m thick deposit of its rock-shelter III.F-23, the layers 8–6 are late Acheulian, layer 5 is middle palaeolithic and the rest (i.e. the layers 4–1) are microlithic.

In the Son valley section (Sidhi district) of Madhya Pradesh a clear assessment of the stratigraphic situation has been made by Williams and Clarke. Their reconstruction of the Quaternary history of this part of the Son valley is as follows:

TABLE II.9

*Quaternary History of the Middle Son Valley (Madhya Pradesh)*

(after Williams and Clarke, 1995)

(i) Bedrock erosion and pedimentation of Lower Vindhyan metasediments (limestone, shale, chert, sandstone), probably during the Middle Pleistocene. Deposition of debris flow rubble and alluvial fan gravels and clayey gravels with some reworking by the palaeo-Son near present low river level. Lower palaeolithic flakes, cores and bifaces of quartose sandstone and quartzites on and in these Sihawal Formation gravels.

(ii) Deposition of fine sandy clay loess during and after accumulation of Sihawal Formation gravels; i.e. a Sihawal Fine Member and a Sihawal Coarse Member. (?) Middle Pleistocene.

(iii) Erosion followed by deposition of Patpara Formation gravelly clays and fluviatile sands. Upper Acheulian to Middle Palaeolithic artefacts interstratified among both fine and coarse facies of the Patpara Formation. Syn-depositional and/or post-depositional reddening of clays and sands. Middle to Upper Pleistocene.

(iv) Erosion followed by deposition of Baghor Formation channel sands, overbank clays and yellow-brown loess. Middle to Upper palaeolithic. Upper Pleistocene.

(v) Several intervals of episodic downcutting, lateral planation and inset terrace formation. Upper Palaeolithic, Mesolithic and Neolithic. Upper Pleistocene to Holocene.

An important aspect of the prehistoric research conducted in the Sidhi district by G.R. Sharma, J.D. Clark and their group is the excavation of the upper palaeolithic site of Baghor I.[20]

Palaeoliths occur all over Maharashtra, including the Konkan coast on the west and in the Wardha–Wainganga valleys in the east.The well-known stratigraphic profiles in archaeological literature are those of the Mula–Mutha rivers in Pune, the Godavari in Nasik, the Pravara (a tributary of the Godavari) in Nevasa and the Tapti river system at Patne near Chalisgaon. The Dattawadi locality on the Mutha river in Pune shows the succession of gravel bed (12 ft thick and with lower palaeolithic tools) > dark red silty bed (35 ft thick) > fine gravel (middle palaeolithic tools) > ashy grey silt, with the last two deposits abutting against the older deposits. The Gangawadi locality on the Godavari in Nasik shows the succession of bedrock > pebble gravel (lower palaeolithic tools) > thick brownish silt. The Hathi Well section at Nevasa on the Pravara shows a loose gravel over the earlier gravel with lower palaeolithic tools. This second gravel contains a middle palaeolithic assemblage of scrapers, points and borers made on finer raw materials like jasper and chert. The fact that this 'middle palaeolithic' assemblage may be the small tool component of the Acheulian has already been pointed out. Further, it has been argued that the Acheulian and this 'middle palaeolithic' are parts of the same geological unit. A thick bed of bouldery/pebbly gravel at the junction of the Chirki and Pravara streams was excavated for a number of years beginning in 1967 with the expectation of discovering a camp site. Although this expectation was not fulfilled, it was realized that the bouldery terraces near the river were used to manufacture tools made of local and imported materials. The Patne section begins with the middle palaeolithic tools at the bottom and passes on to the mesolithic through four stages of the upper palaeolithic. The subdivisions of the upper palaeolithic based on typology are corroborated by the local stratigraphy and there is no doubt that there is a steady continuity with a remarkable degree of overlap with the mesolithic level. By the time the Patne sequence reaches the mesolithic, the primary raw material is chalcedony instead of jasper; there is also a disc-bead made of a fragment of ostrich shell among the upper palaeolithic tools. Lower palaeolithic and later artefacts have been obtained in the Konkan coast from the Gujarat border to Goa, and the sequence shows a gravel silt succession.[21]

In Karnataka, the Malaprabha–Ghataprabha system, a tributary system of the river Krishna, has been well known for its prehistoric sites since the nineteenth century. The lower palaeolithic–middle palaeolithic succession is represented by two succeeding gravels at various places such as Taminhal. The Taminhal section shows the following ordering of deposits: mottled clay > gravel > clay > fine sandy gravel > fine gravel > modern clay. In the Hunsgi–Baichbal valleys, the Acheulian artefacts are located either

within the black soil of the surface or within a brown clay which underlies the black soil. At Yedurwadi on the Krishna the artefact–horizon is a gravel with a number of buried trees preserved as calcrete casts. The idea that most of the Hunsgi–Baichabal sites are in 'non-fluviatile sedimentary contexts' has been disputed by Sheila Mishra who thinks that they were buried by fluvial silts which subsequently became pedogenized.

It may be noted at this point that the entire prehistoric stratigraphy of the Deccan is now being visualized in terms of a few geological 'formations', basically several deposits containing some common properties. The implication of this approach is not archaeologically very clear yet, but the 'formation'-wise arrangement of the Deccanese prehistory certainly deserves a mention at this place.

TABLE II.10

The Geological Profile of Prehistory in the Deccan

(after R.S.Pappu, 1995)

| | |
|---|---|
| *Bori Formation* | 2–8 m thick—exposed primarily in the Kukdi valley in Pune district, Maharashtra—fine-textured, dark-brown silty clays and gravels—associated with a thick volcanic ash deposit (1–1.5 m)—occurrence of Acheulian tools—date problematic. |
| *Godavari Formation* | gravels occurring at elevations of 6 to 35 m above the present bed of the river, and mostly beyond the reach of the modern floods—traced at a number of places on the Krishna, Bhima, Godavari, Ghataprabha, Malaprabha and Tungaprabha rivers—occurrence of middle palaeolithic tools in certain areas—non-implementiferous in others—suggestion of a braided system of low sinuosity channels—an aggradational phase—date problematic. |
| *Upper Bhima Formation* | rests against the Godavari Formation and is the most pervasive quaternary deposit in the Godavari, Bhima and Krishna valleys—5–30 m thick, divided into a lower coarse-grained pebbly–cobbly gravel and an upper fine-grained sandy-pebbly gravel—Acheulian tools in secondary contexts and occasionally in association with the fossils of *Equus, Elephas,* and *Bos* found in the lower member—upper palaeolithic material found in the upper member—the terminal Pleistocene character of the upper member. |
| *Chandanpuri Formation* | colluvial deposits in the foothill zones of the valleys—late Pleistocene. Post-Black-Soil Formation: Holocene. |

Climatically, the late Pleistocene picture in the Deccan seems to be that of semi-aridity till the end of the Pleistocene. There was a rejuvenation of streams in the early Holocene, and obviously the climate then became wetter. Interestingly, the calcrete formation antedating the gravel with Acheulian tools in the Malaprabha valley has yielded the following information : 'Nontronite and traces of kaolinite at the base of the calcrete and an increase in the content of montmorillonite and dolomite upwards in the profile are indicative of a transition in rainfall regimes from higher to lower during its formation.'[22]

Not much is yet known about the stratigraphy of quartz pebble tools from the Palghat district of Kerala, the only area with reported palaeolithic tools in the State.[23] In Tamil Nadu, palaeolithic research is centred in the area near modern Chennai[24] and here the stratigraphy has been made explicit by Shanti Pappu:

TABLE II.11

*The Stone Age Sequence around Chennai*

(after Shanti Pappu, 1996)

| | | |
|---|---|---|
| Holocene | Palar–Kortallayar surface silts | sterile |
| ---------- | Ferricrete lag ---------- | microliths |
| Late Pleistocene | Ferricrete lag and sheet gravel | late middle palaeolithic |
| ------- | Clayey silts and calcrete lag ------- | sterile |
| Middle Pleistocene to early late Pleistocene | Ferricretised and ferruginous colluvial deposits, stream and sheet flood deposits, channel-lag and channel fill deposits, terraces | Acheulian—middle palaeolithic |
| ---------- | Unconformity ---------- | early Acheulian |
| Tertiary to early Pleistocene | Ferricretes | |
| Bedrock | | |

We are not sure how this stratigraphy relates to the sequence offered by K.D. Banerjee in the cliff section near Budidamanuvanka, which showed the following succession: shale (bedrock) > clay (handaxes and cleavers) > detrital laterite (post-Acheulian flake industry) > brownish silt (sterile) > surface (microliths).

Both coastal and inland Andhra are rich in palaeolithic sites. Various

Andhra districts (Cuddapah, Kurnool, Chittoor, Nalagonda, Nellore, etc.) have been surveyed for palaeolithic remains, the sequence showing the usual two-fold gravel–silt succession. However, the Kurnool area of Andhra possesses evidence of cave-sites occupied during the upper palaeolithic stage and the use of bone tools during this period, the only such categorical evidence available from the subcontinent (the Sanghao cave in the north-west has upper palaeolithic occupation but no bone tools). In the Visakhapatnam area of the coast Acheulian industries have been related to an old sea level which is 7+ m above the modern mean sea level.[25]

Up along the east coast, Orissa is rich in palaeolithic remains too, some of her more prominent areas in this regard being the districts of Mayurbhanj, Dhenkanal, Sundargarh, Sambalpur, Phulbani, Bolangir, etc. In the Mayurbhanj area, the sequence above the bedrock shows the succession of mottled clay > lateritic conglomerate or what has been called a secondary laterite > and a sandy deposit or a thin layer of clay, whereas in many other areas the sequence shows a two-fold gravel-silt succession. All the three phases of the palaeolithic occur widely.[26]

The western part of West Bengal, which is an upland region as opposed to the Gangetic delta, contains a large number of palaeolithic sites in the districts of Birbhum, Burdwan, Bankura, Purulia and Midnapur, primarily within the framework of the following section:

TABLE II.12

*The 'Lateritic Conglomerate' Stratigraphy of Prehistory in West Bengal, Singhbhum (Bihar) and Mayurbhanj (Orissa)*

(after Chakrabarti, 1993)

| |
|---|
| Yellowish sandy deposit—basically covers microliths |
| Compact lateritic matrix with small lateritic gravels—lower palaeoliths occur towards the base—middle palaeoliths have been found in the upper half of the deposit—the horizon of the upper palaeolithic tools towards the top of this matrix |
| Mottled clay—basically yellowish with a pinkish shade—sandy, non-implementiferous |
| Primary laterite, preceded by bedrock |

However, along the Tarafeni river in Midnapur, and possibly along a few rivers in Purulia, one finds the usual gravel-silt succession too, the lower palaeoliths being confined to the cemented gravel at the base of the sequence. The only climatic inference available is in the context of excavations at the microlith-bearing site of Birbhanpur where a comparatively dry climate has been suggested for the end phase of the Pleistocene, with

the earlier strata being deposited 'under conditions of large quantities of moisture and a high mean annual rainfall with a downward percolation of water'.[27]

The entire Chhotanagpur section of Bihar and a few areas beyond this plateau have yielded palaeolithic sites. The Chhotanagpur section comprises the former districts of Singhbhum, Ranchi, Palamau, Hazaribagh–Giridih and Santal Parganas whereas the non-plateau sections comprise the Nawadah plateau section of the Gaya district extending up to Rajgir and the Kharagpur forest area of Munger. The palaeolithic stratigraphy of Bihar varies widely, but in eastern Singhbhum it is basically an extension of the bedrock > mottled clay > lateritic conglomerate > sandy deposit section that we have observed in the western part of West Bengal and the Mayurbhanj–Keonjhar section of Orissa. At a number of places in Singhbhum itself, the two-fold gravel–silt cycle occurs as it does in other areas of Bihar. The site of Paisra in the Kharagpur forest of Munger has been excavated, and the concentration of upper palaeolithic sites in the Damin area of the Rajmahal hills deserves notice. Here, rich upper palaeolithic levels can be observed in the surface soil overlying the local bedrocks. Another area which has shown a rich upper palaeolithic assemblage is Palamau.[28]

The palaeolithic remains of UP are basically concentrated in the Lalitpur–Jhansi area, the Giri–Govardhan area near Mathura, the Singrauli area beyond Renukut and the Belan valley section near Allahabad.[29] The gravel–silt succession has been noted in Lalitpur, Singrauli and elsewhere, but the area where detailed stratigraphical studies have taken place is the Belan valley, first by G.R. Sharma and his group and later by Williams and Clarke. The Williams–Clarke stratigraphy for the middle Belan valley is as follows:

TABLE II.13

*The Prehistoric Sequence of the Belan Valley (Uttar Pradesh)*

(after Williams and Clarke, 1995)

1. Tabular sandstone conglomerate over Vindhyan sandstone bedrock. Lower palaeolithic leavers and bifaces. Age probably middle Pleistocene.
2. Calcareous brown clay loam. Archaeologically sterile. (?) Middle Pleistocene.
3. Planar and cross-bedded sandstone gravels. Middle palaeolithic artefacts. (?) Late middle to (?) early upper Pleistocene.
4. Reddish-brown sandy clays and clay loams. (?) Upper Pleistocene. Archaeological associations not known.
5. Shell-bearing gravel(s), mostly rolled carbonate nodules and black ironstone pisolites. Upper palaeolithic artefacts. Upper Pleistocene (*c.* 25 kyr to 19 kyr BP).

6. Brown and yellow-brown calcareous clay loam and sandy clays. Minor intraformational gravels, mainly rolled carbonate nodules. Upper palaeolithic to Epi-palaeolithic and (?) mesolithic artefacts. Age late upper Pleistocene (*c.* 25 to *c.* 10 kyr BP).
7. Holocene clays, loams and fine alluvial sands. Mesolithic, neolithic and protohistoric artefacts.

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More positive reports from Assam and elsewhere in the north-east are needed before that region can be included in the palaeolithic distribution map of the subcontinent. An upper palaeolithic industry in fossil wood has been found in the Lalmai hills of Bangladesh and in the Haora and Khowai river valleys near Agartala in the western part of Tripura. Implements—handaxes, handadzes, blades, burins, backed knives, points, etc. made of a type of fossilwood which possesses a flinty core beneath the fibrous woody surface—were found within the depth of 1 m below the present surface. This Lalmai–Tripura fossil wood industry has been found to be identical with the Late Anyathian 2 fossil wood industry of the upper Yarrawaddy valley of Myanmar (Burma). This identity brings to light the existence of an extensive and distinctive upper palaeolithic situation covering the India–Bangladesh–Myanmar borderlands.[30]

Finally, Gudrun Corvinus has placed on firm footing the palaeolithic prehistory of Nepal. The stratigraphic evidence comes mainly from the Dang and Deokhuri valleys in the Siwaliks of western Nepal.[31]

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TABLE II.14

*The Prehistoric Sequence of the Dang-Deokhuri Valleys of Western Nepal* (after Corvinus, 1995)

1. Lower Siwaliks bedrock

   – – – – – – – – – – – – – – – – – – unconformity – – – – – – – – – – – – – – – – – –

2. Basal gravel—handaxe assemblage at Gadari in Dang and an industry of huge flakes and cores in the tributary valley of the Tui—middle Pleistocene
3. Babai formation—older alluvium, up to 25–30 m above river level, and with red soil formation on surface of the older alluvium—flake industries and flake-chopper industries in the Dang system and flake-chopper assemblages, a chopper industry and a flake-blade industry in the Deokhuri system—late Pleistocene

   – – – – – – – – – – – – – – – – – – downcutting – – – – – – – – – – – – – – – – – –

4. Sitalpur formation—younger alluvium of 10 m level—no associated industry so far.
5. Recent flood plain deposits

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## CHRONOLOGY[32]

In an earlier section we have considered the evidence of, and the still limited number of dates from, the early or pre-middle Pleistocene context of palaeoliths in the subcontinent. There is a greater availability of dates from the middle Pleistocene context and later, although these are restricted to a handful of regions: the north-west, parts of western Rajasthan, Gujarat, Malwa and the middle Son valley in Madhya Pradesh, Maharashtra, and parts of Karnataka, Andhra and Uttar Pradesh. Even within these areas there is a remarkable uneven distribution of dates period-wise, the radiocarbon dates of the middle and upper palaeolithic being far more frequent than the dates available for the lower palaeolithic which fall beyond the 50,000 BP range of the radiocarbon method. The non-radiocarbon dates for the middle and upper palaeolithic too are rare.

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### TABLE II.15

*Region-wise Tabulation of Middle Pleistocene and Later Dates from the Indian Lower, Middle and Upper Palaeolithic*

*North-west*: In the extreme north-west there is a series of dates (C-14) available for the *Sanghao cave* sequence which dates from the *upper palaeolithic*. About 15 consistent dates show an even spread between 41,825 ± 4,120 BC and 20,660 ± 360 BC, with only one sample showing a calibrated single standard version of 12,088 BC.

At the sites of Jalalpur and Dina in the *Potwar plateau* the date of the *lower palaeolithic* has been dated 600,000–400,000 BP (palaeomagnetic stratigraphy) whereas a minimum date of 45,000 BP has been estimated for the *upper palaeolithic* at site 55 of Riwat in the same region.

*Western Rajasthan*: Only one stratigraphic profile (named 16 R) at *Didwana* has yielded all the dates from the region: the *lower palaeolithic*—more than 390,000 BP (Uranium/Thorium series method); the *middle palaeolithic*—144,000 BP, 1,50,000 BP (Thermoluminiscent dates of the quartz grains from the relevant level); the *upper palaeolithic*—26,210 ± 2200/1700 BP (C-14).

*Saurashtra (Gujarat)*: Dates come from the *Hiran valley* stratigraphic profile: the *lower palaeolithic*—roughly between 190,000 and 69,000 BP (Uranium–Thorium series method dates of the miliolite deposit which overlies the Acheulian level); the *middle palaeolithic*—56,800 BP (U-Th series date of the second miliolite deposit overlying the gravel-bearing middle palaeolithic industry).

*Madhya Pradesh:* The *Son valley*: the *lower palaeolithic*—more than 103,800 ± 19,800 BP (TL date of the loess deposit overlying the level with Acheulian tools; the *upper palaeolithic*—C-14 dates are either from the geological deposit of Baghor Formation or from the upper palaeolithic site of Baghor I, and focused between 10,000 and 12,000 BP. The *Narmada and Chambal systems*: quite a few C-14 dates have been obtained from the *upper palaeolithic* levels of this region, the earliest being those done on ostrich egg shell pieces from Chandrasal

in the Chambal system (36,550 ± 600 BP and 38,900 ± 750 BP), Nagda in the same system (more than 31,000 BP), and Mehtakheri (Madhya Pradesh, but the precise area unpublished), one sample (ostrich egg shell) from which is more than 41,900 BP and a second sample (freshwater shells) from the same site is 30,680 ± 1040–920 BP.

*Maharashtra*: The *lower palaeolithic* at Nevasa (the Pravara valley) has been estimated to be more than 350,000 BP (Uranium–Thorium series). The earliest dates for the *upper palaeolithic* of the region are 27,000–25,000 BP but the bracket comes down to *c.* 13,000 BP and slightly later.

*Karnataka*: At Yedurwadi in the upper Krishna valley the *lower palaeolithic* is earlier than 350,000 BP. Teggihalli in the Hunsgi–Baichbal section has two lower palaeolithic dates (more than 350,000 BP and 287,731 + 27,269/–18,186 BP, both Uranium–Thorium series) whereas Sadab in the same area gives another Uranium–Thorium series date, 290,405 + 20,999/–18,186 BP.

*Andhra*: Only *upper palaeolithic* dates are available from the Kurnool caves—two obtained by Electron Spin Resonance (ESR) method and one by TL. The ESR dates are 16,686 BP and 19,224 BP. The TL date is 17,390 BP ± 10 per cent variation.

*Uttar Pradesh*: Only *upper palaeolithic* dates (C-14) are available from the Belan valley, the earliest point around 25,000 BP and the last one around 9,000 BC.

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In the context of the wide distribution of palaeolithic sites and related stratigraphic profiles in the subcontinent, the preceding tabulation of the major palaeolithic dates is unlikely to appear impressive, but when one considers that this is by and large the result of recent and ongoing research, it is an impressive move forward. The lower palaeolithic in India is now firmly ensconced in the middle Pleistocene, and as we have noted, in the early Pleistocene as well, at least in the Potwar plateau and the Siwaliks. Sheila Mishra, in fact, notes that the lower palaeolithic dates which have been listed from Didwana, Yedurwadi and Nevasa and at least one date from the Baichbal sites are beyond the limits of Uranium–Thorium series method, i.e. the method which has been applied in these cases. This means that their chronological range in these cases is earlier. Moreover, as Anupama Kshirsagar has shown, the fluorine/phosphate ratio in the fossils found at Nevasa, Hunsgi and Yedurwadi can be dated to the middle Pleistocene, thus matching the absolute dates provided by the Uranium–Thorium series method.

## Cultural Evidence

### *Preliminary Remarks*

The palaeolithic sites of India have been divided into primary, semi-primary and secondary categories, depending on their relationship with the

place where the tools were first manufactured: original position, slightly removed from the original position through colluvial forces, and indeterminably removed from the original positions through alluvial agencies. The tools reported from various cliff sections, which occupy a vast space of the Indian literature on palaeolithic archaeology, belong unhesitatingly to the last group. Manufacturing places, known as 'factory sites' in literature, occur widely on the surface, and if there is no indication of major post-depositional disturbance, they may be assigned at least a semi-primary status. Such factory sites provide insight into how the tools were manufactured and if preference was shown for a particular type of raw material. For instance, in the Rorhi hills of Sind, Bridget Allchin noticed that the middle and upper palaeolithic people showed a distinct preference for a dark grey-coloured chert with the mottled black and rust-coloured patina or encrustation at the top, whereas the much later people of the Harappan civilization using the same area for their stone tools preferred light buff chert with a cream-coloured patina. In the Lalmai hills of Bangladesh, it has been noted that the local tool manufacturers invariably selected only those pieces of fossil wood which possessed a flinty core below the fibrous wooden matter at the top. Further, when such sites of a limited area are studied in their totality, they may throw light on some hitherto unperceived dimensions of the contemporary life. In the Raisen district of Madhya Pradesh, Jerome Jacobson located 94 Acheulian surface sites within an intensively surveyed area of 175 sq km and lying almost exclusively in a plateau plain: some near present stream channels, some on open plains away from the present streams and some (about 10 per cent of the total number) clustered at the base of the local hills. With only one exception, the *in situ* (i.e. the original position) status of these occurrences have been confirmed by geologists 'who could comprehend no natural agency capable of transporting the artefacts to their present positions.'

One locality—*Minarwala Kund* or a large forest pool in a stream bed—showed a large number of clusters ranging from *c.* 1500–4500 sq m, with six of them covering *c.* 2000–3000 sq m (or between half and three-quarters of an acre) each. On the gridded map of the entire locality 'the patterns of what seemed to be at least seven individual concentrations of tools could be discerned, dense towards the centres, thinning toward the peripheries'. The behavioural implications are not clear, but a pattern emerges out of the surface occurrence of tools.

The occurrence of the first type of sites, i.e. primary sites, is still very rare in the subcontinent, no doubt because of the inadequacy of research. The cave sites are undoubtedly primary, but there are only three excavated cave sites: the upper palaeolithic Sanghao and Kurnool and the Acheulian

rock-shelter III.F-23 at Bhimbetka. Sites buried in the alluvium or other deposits, such as those found in west Rajasthan, at Hunsgi in Karnataka, Paisra in Bihar and site 55 of Riwat in Pakistani Punjab are primary sites too. At Hunsgi, Paisra, and site 55, as will be seen below, there is some structural evidence. Hunsgi and Paisra are lower palaeolithic whereas site 55 is upper palaeolithic. As far as the upper palaeolithic is concerned, there is more evidence from Baghor I in Sidhi, Madhya Pradesh, and the Kurnool caves of Andhra. No such case can be cited for the middle palaeolithic; even at the excavations at Samnapur, which have been argued to belong to a semi-primary context, no cultural material except tools and the associated debris has been found.

There is, of course, a vast amount of literature on the palaeolithic tool types in India, which comfortably fit in the various categories of palaeolithic tools found in Africa, Europe and elsewhere in Asia. The modern classificatory system depends on a close analysis of different morphological attributes of the tool-type concerned, which is often statistically represented. Another field of statistical enquiry in this field is the inter-site variability of different assemblages. Such studies are necessary both to quantify and represent the data, although their cultural implications may not always be clear. A line of study which has not yet begun in the Indian context—at least not in a major way—is to obtain close insights into the actual manufacturing process of stone tools by replicating them. The difference in the distribution between pebble-based 'chopper–chopping' tools and the handaxe–cleaver assemblages, which was once an important theme of Indian palaeolithic literature, is no longer valid. If the pebbles constitute the dominant raw material of a given area, its palaeolithic industry will contain many pebble-based types. It is now acknowledged to be as simple as this. Besides, it may also be a question of functionality; some functional needs may perhaps be better fulfilled by making tools out of pebbles. Another field of study which is still largely undeveloped in the Indian situation is the use–wear analysis of tools, which is a good technique to judge the probable function of a particular tool and based essentially on microscopic studies of the wear marks at the edge of the tools and their ethnographic interpretation. The broad evolutionary sequence of the Indian palaeolithic industry from the Acheulian to the upper palaeolithic is beyond doubt, and in the field of the Acheulian itself, Misra's postulate of two developmental stages seems to be valid.

> One, probably chronologically earlier, is characterized by such core tools as handaxes, choppers, polyhedrons, and spheroids, a low proportion of crudely made cleavers and of flake tools, the predominant use of the stone-hammer technique, and the absence of the Levallois technique. . . . The second, and probably younger

one, is marked by the low proportion of bifaces, the high ratio of cleavers to handaxes, the very high proportion of flake tools like scrapers, the extensive use of the soft hammer technique and the knowledge of the Levallous and discoid core technique.[33]

Earlier, we noted that the assumption of an evolutionary sequence of handaxe in India from a pebble-base is still uncertain. Although the very idea seems to be ignored in the current literature, it is worthwhile to draw attention to the results of excavations at Durkadi near Maheshwar where fresh pebble artefacts (choppers and crude flakes) were observed in stratigraphic association with one irregularly shaped, pebble-butted handaxe and two protohandaxes in the top 15 cm of a boulder conglomerate deposit overlain by a thick layer of clay. The association between a large number of pebble tools and these three pieces of handaxe in the Narmada boulder conglomerate has led to the hypothesis that there could be an evolution of handaxe from the pebble-based industry here.

The use of bone tools, which is a common feature of European upper palaeolithic, is limited in the Indian upper palaeolithic context only to the Kurnool caves, 90.30 per cent of the tools excavated in the cave called Muchchatta Chintamanu Gavi being made on shafts of long animal bones and including finished forms of scrapers, perforators, chisels, scoops, shouldered points, barbs and spatulae. However, we do not know if the use of bone tools was limited only to this part of Andhra or was common in other areas too.

### *Beyond Tools*

Those who are not interested in the minutiae of tools will wonder why the evidence of living beyond the manufacture of tools is so very limited in the Indian context, especially in view of the fact that such evidence is not at all rare in the suitably investigated palaeolithic localities elsewhere in the world. This may be due partly to the lack of discovery of many primary sites, and partly to the fact that the spots where tools were manufactured were not the spots where people put up their hearths and spent nights. Considering that we are dealing with peripatetic hunting-gathering groups living in temporary shelters made of reeds, branches of trees and possibly even leaves in a basically arid/semi-arid landscape where considerable erosion has taken place since then and where the monsoonal rainfall will obliterate traces of temporary abodes of the last summer, we really cannot expect to find much evidence of actual living beyond the lithics in Indian palaeolithic sites, unless they were actually using stone blocks as parts of dwellings or living in caves and rock-shelters.

Hunsgi in Gulbarga, Karnataka, is one of the few open-air Acheulian

sites in India to have revealed some indications of structural evidence. The evidence comes from Locality-V. In an excavated area of about 63 sq m the Acheulian occupation level

was compact and consisted of slab-like pieces . . . as also pebbles and cobbles . . . of limestone. . . . The limestone pieces as well as the small number of pieces of sandstone, quartzite, dolerite, and chert, also found in the level, were obviously introduced by man from outside to serve as raw material. The floor also contained numerous fragments of granite, which form part of the rock outcrop at the locality. The fresh physical condition of artefacts and the lack of any preferred orientation in the positions of their long axes as well as those of rock fragments clearly exclude the role of fluvial agency in the formation of this level. . . . An interesting aspect of this floor was that its limits were defined by granite blocks (up to two metres across) on the eastern, western and northern sides. While those on the eastern and western sides form part of the granite outcrop itself, the blocks on the northern side appear to have been arranged in a line by man because they occur as individual blocks and do not extend below the level of the occupation floor. This feature, taken together with the occurrence of granite pieces . . . of various sizes in the occupation level, suggests that the Acheulian inhabitants selected for occupation an open area with hard surface and already surrounded by large granite boulders; improvements were made by arranging a row of boulders on the northern side. Apart from serving to demarcate the camping ground and providing protection from wind, these blocks must have facilitated the erection of temporary shelters of leaves/grasses and branches. From the fact that very few artefacts were found outside the limits set by these boulders, it is clear that the occupation floor we are dealing with is a complete one.[34]

Paisra is in the area of Bhim Bandh, a hot spring located in the Kharagpur forests near Munger in Bihar. In one of the Acheulian working floors excavated here (Locality D), P.C. Pant and Vidula Jayaswal noted that

The entire excavated area was found extremely rich in finished and semi-finished tools, cores, flakes, chips and blocks of quartzite, some of which were presumably meant as raw material for manufacturing tools, and as anvils. The most significant evidence yielded by this area was a series of post-holes indicative of actual habitation of the locality by the Acheulians. As many as 8 post-holes were revealed. . . . The post-holes were of unequal size, the larger ones measuring about 20 cm in diameter and the smaller ones only about 12 cm. Apparently, they do not seem to exhibit any definite pattern of the form of structures. However, they seemed to occur usually in groups of two, separated from each other by a distance of about 80 to 120 cm. It is quite interesting that in the case of at least two such groups, one of the post-holes was considerably larger than the other. They had been dug into the very compact deposit of haematite pellets and were easily recognizable because of their filling of light yellow earth. They varied in depth from 20 to 30 cm. The entire evidence was distinctly suggestive of thatched superstructures of temporary nature, like which is constructed by tribal nomads even today.[35]

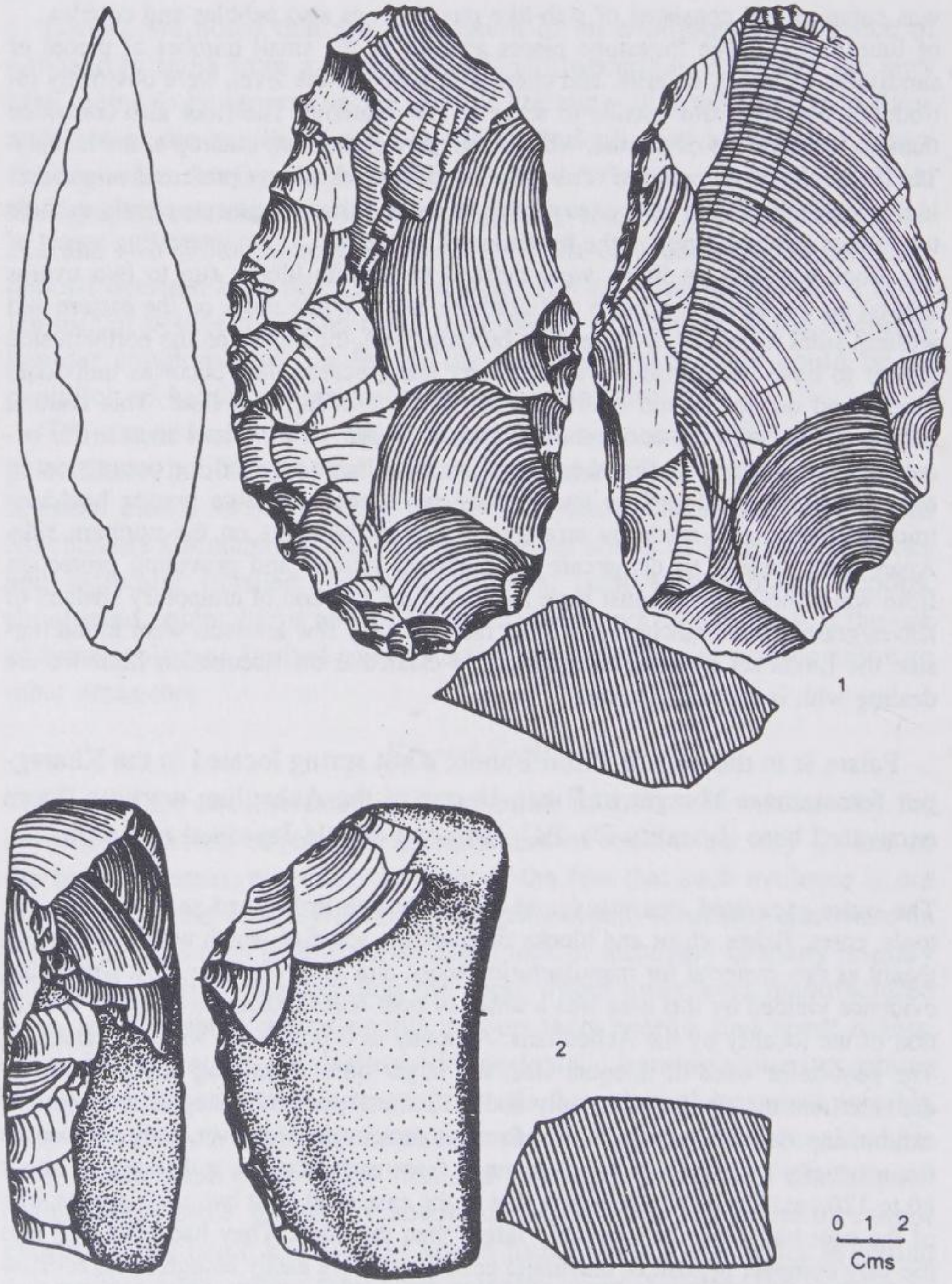



Fig. 3 Lower Acheulian knife and chopping tool, Locality VI, Trench I, Hunsgi (Paddayya, 1982)

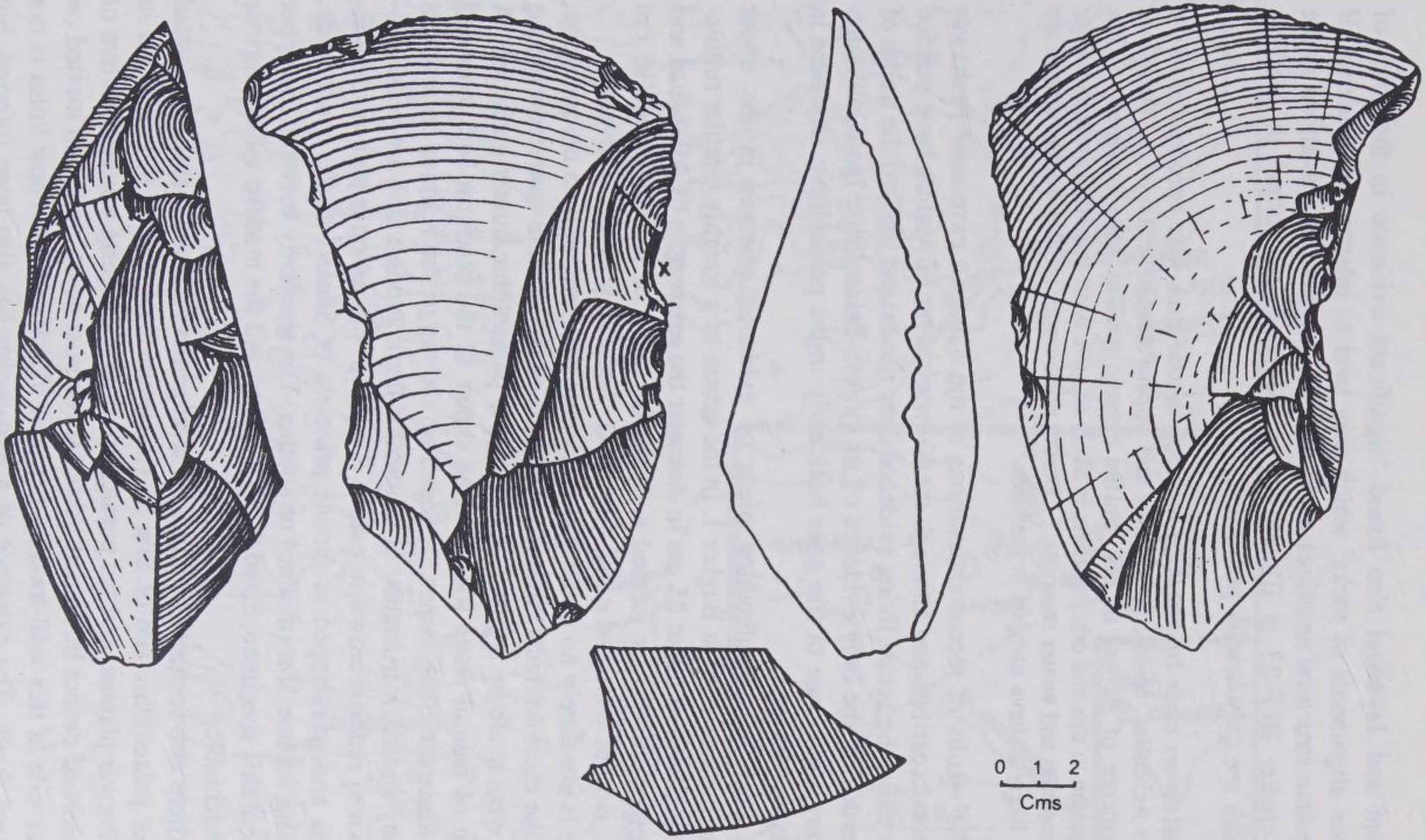



Fig. 4 Lower Acheulian cleavers from Hunsgi, Trench I, Locality VI (Paddayya, 1982)

Pant and Jayaswal also found 'significant evidence in the form of various alignments of rocks' which they tend to interpret as evidence of Acheulian structural activities of the site. The results of excavations in the rock-shelter III.F-23 at Bhimbetka to the south of Bhopal in Madhya Pradesh are only briefly published.

> Several floors made by arranging rocks of various sizes were encountered in the Upper Acheulian, Middle Palaeolithic and Upper Palaeolithic levels. . . . There was no evidence of the use of fire, and no organic remains have survived. . . . The occupation in this and other shelters is likely to have been seasonal, perhaps during the monsoon and winter seasons. . . . During the summer months human groups are more likely to have camped in the open.[36]

The results of recent excavations in the Sanghao cave near Peshawar are not accessible, and although the Kurnool caves of Andhra have yielded bone tools, the actual living evidence does not extend beyond the traces of a hearth fire, the only evidence of its kind in Palaeolithic India, although the direct evidence of fire goes back early in the palaeolithic sequence in China and Europe.

A positively breathtaking piece of evidence emerges in the upper palaeolithic context at Baghor I. In the centre of a roughly circular rubble-built platform of about 85 cm in diameter the excavators of Allahabad and Berkeley universities located a triangular piece of natural stone (15 cm high, 6.5 cm wide and *c.* 6.5 cm thick). According to the excavators, '. . . there is absolutely no doubt that the rubble platform with its unique stone, and the chert artefacts throughout the rest of the site, are contemporaneous and were made by a group of final upper palaeolithic hunter-gatherers.' A piece of natural stone found in the centre of the platform has generated great interest. Such stones are found on the top of the Kaimur escarpment nearby and show triangular or ellipsoidal laminations which are yellowish-brown to reddish-brown in colour. They are placed on rubble-made platforms and worshipped as female principle or *Shakti* in the countryside, passing for one *Mai* (mother) or another. The similarity between the upper palaeolithic specimen, dated 9000–8000 BC and the modern village shrines is undeniable.[37]

There also seems to be a regular arrangement of rubble at the excavated upper palaeolithic site of Site 55 (minimum date 45,000 BP) at Riwat in the Potwar plateau, and the possibility of its supporting a superstructure of brushwood cannot be denied. About seven post-holes were also located on either side of this wall-footing, but their identification as post-holes is not beyond doubt. The existence of a post-socket has also been inferred, but this, too, is not beyond doubt.[38]

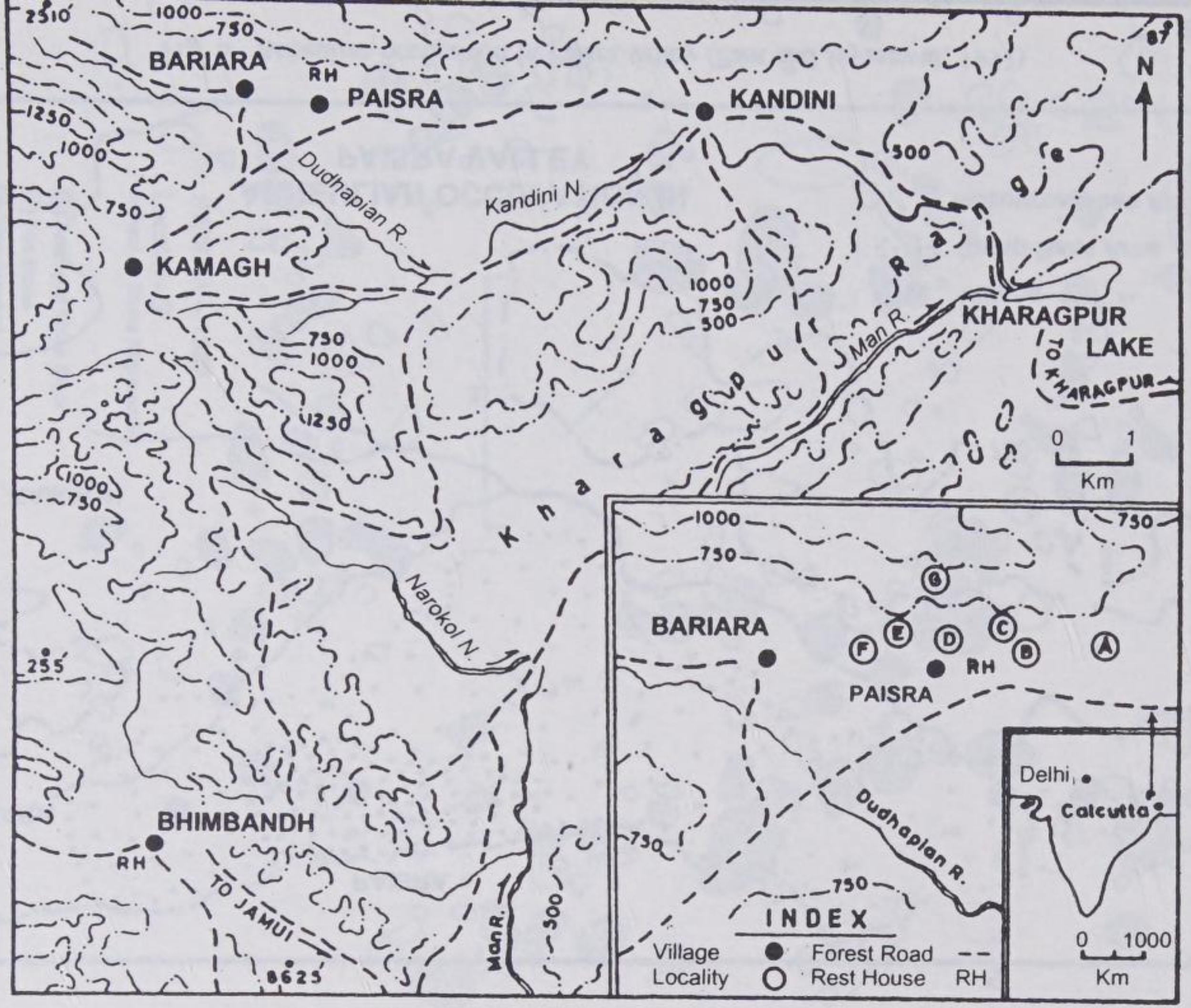



Fig. 5 Site map of Paisra (Pant and Jayasawal, 1991)

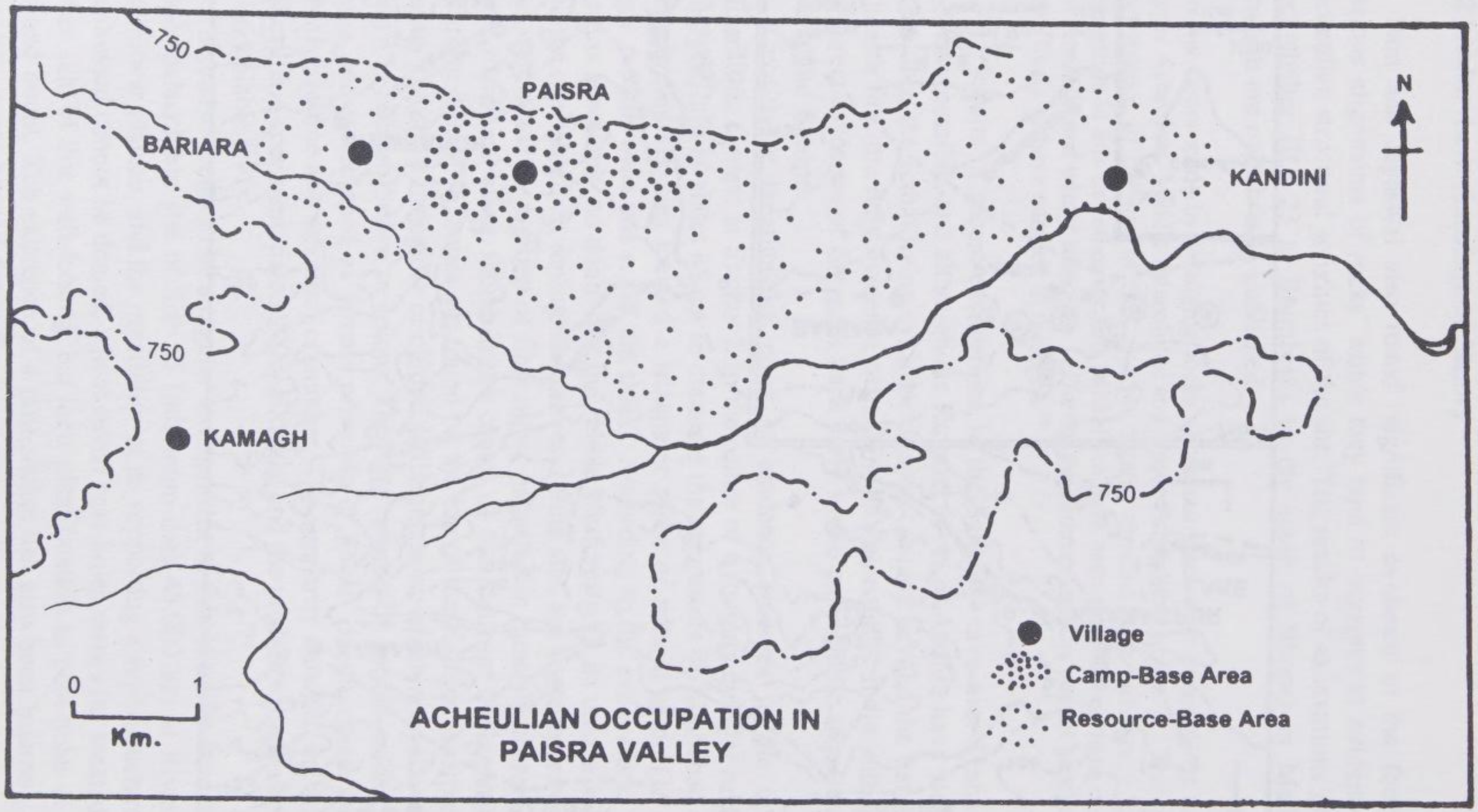



Fig. 6 Acheulian occupation in Paisra valley (Pant and Jayasawal, 1991)

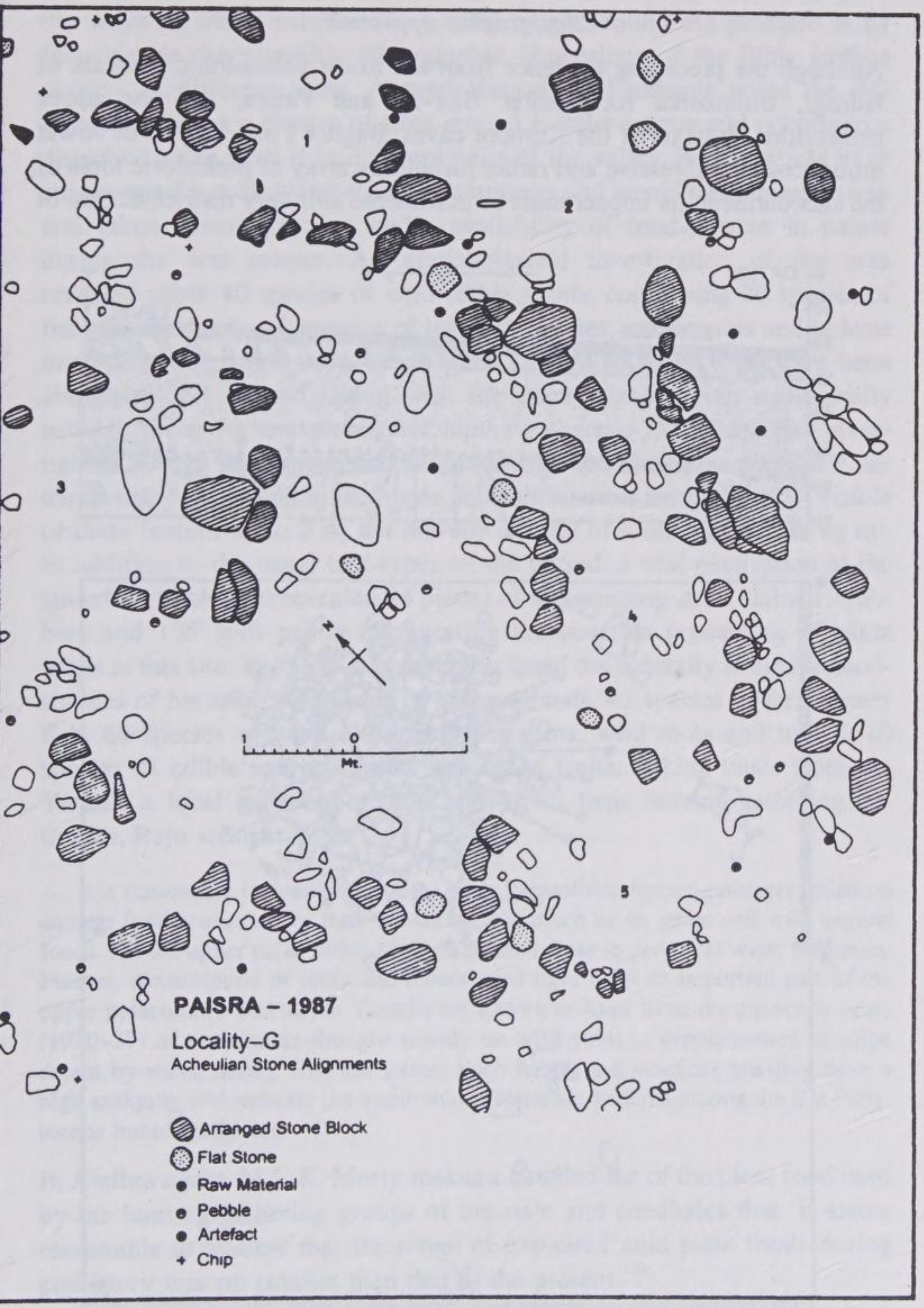



Fig. 7 Paisra, Acheulian stone alignments, Locality G
(Pant and Jayasawal, 1991)

*Ethnographic Approach*

Although the preceding evidence from the lower palaeolithic contexts of Hunsgi, Bhimbetka rock-shelter III.F-23 and Paisra, and the upper palaeolithic contexts of the Kurnool caves, Baghor I and Site 55 of Riwat introduces an impressive and rather forbidding array of prehistoric tools of the subcontinent, its impact must be considered still very restricted. One of

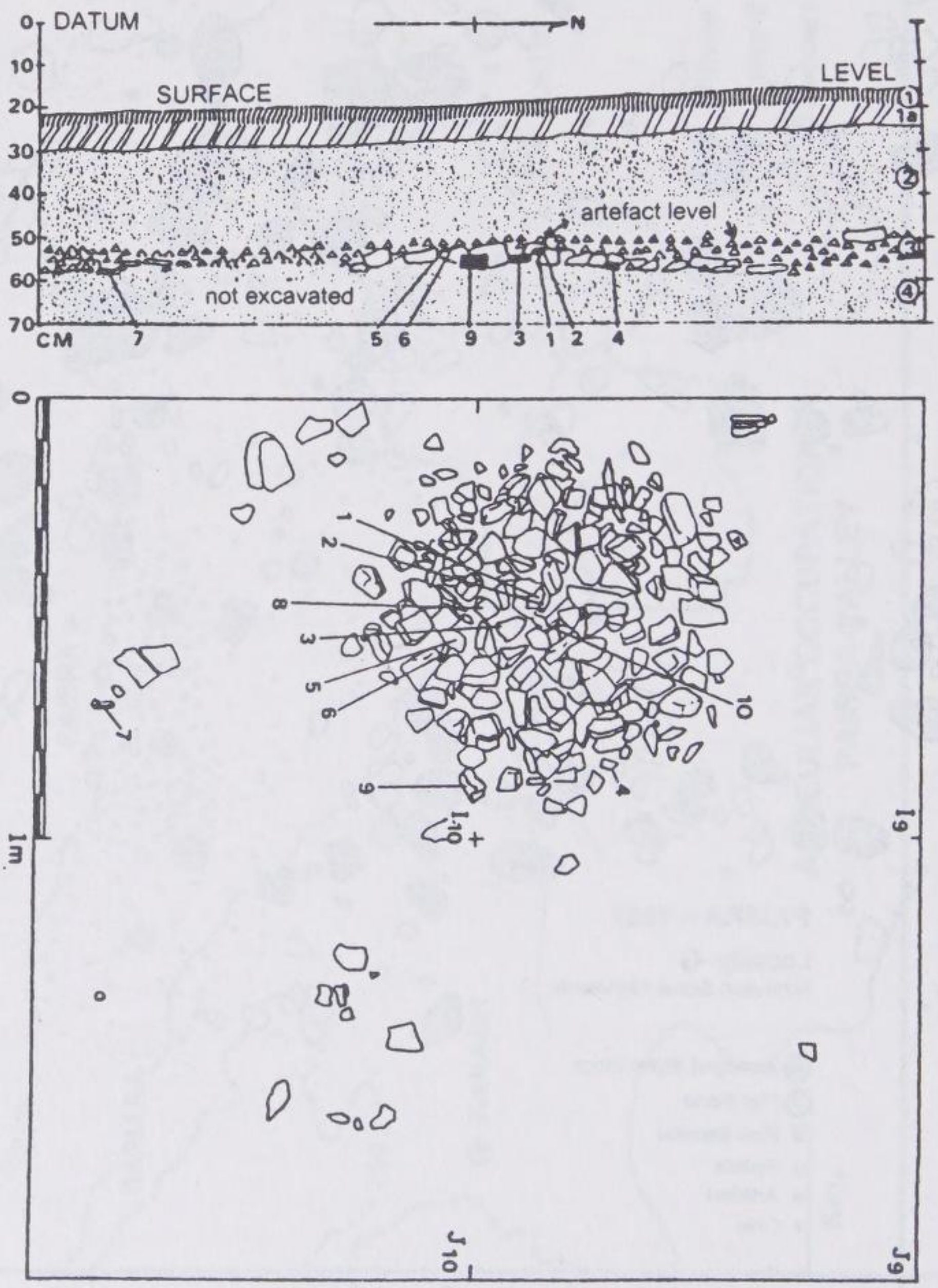



Fig. 8 Baghor upper palaeolithic shrine. The numbers 1 to 10 denote the fragments of vulva-shaped rock (Kenoyer et al., 1983)

the ways in which scholars have tried to get around the problem is by focusing on the plausible ethnographic dimensions of the lithic surface clusters of different areas. Around Hunsgi, K. Paddayya noted the difference between a cluster of sites around a water-source and occurrences dispersed away from it in different parts of the valley. People would have congregated around water-sources in summer and would have moved away and taken advantage of a wider availability of food-sources in nature during the wet season. An ethnobotanical investigation of the area revealed about 40 species of wild edible plants, comprising 26 species of fruits/berries/pods, 10 species of leafy vegetables, mushrooms and at least one species of edible seed. Small game, including birds, must have been abundant, and formed, along with the plant resources, an ecologically suitable niche for the prehistoric hunter-gatherers. D.R. Raju has investigated a large number of prehistoric sites in the Gunjana valley of Cuddapah district of Andhra, the upper palaeolithic sites being the most visible of them (extent up to 2 sq km and the density of tools 5 to 67 per sq m). In addition to the usual tool-types of the period, a trial excavation at the site of Vodikalu also revealed 84 pieces of flat grinding stone slabs, 19 rubbers and 135 split pebbles suggesting the possible processing of plant foods at this site. Raju has also carefully listed the naturally available food-sources of his area: 30 species of game animals, 45 species of fresh-water fish, 68 species of birds, 13 species of yams, wild roots and tubers, 10 species of edible leaves and 25 species of fruits. Taking clues from the Yanadi, a local group of people known for their hunting-gathering activities, Raju writes:

> . . . it is reasonable to predict that the Upper Palaeolithic hunter-gatherers relied on aquatic food resources for their subsistence as much as on game and wild vegetal foods. All the upper palaeolithic sites are located close to perennial water resources. Further, consumption of roots and tubers must have been an important part of the upper palaeolithic diet as the Yanadis are known to have lived during seven years (1950–57) of continuous drought mainly on wild yams ... supplemented to some extent by roots, honey, fish and game. Such habits and practices possibly have a high antiquity and indicate the traditional subsistence patterns among the late Pleistocene hunter-gatherers.

In Andhra again, M.L.K. Murty makes a detailed list of the plant food used by the hunting-gathering groups of the state and concludes that 'it seems reasonable to assume that the range of exploited wild plant foods during prehistory was no smaller than that of the present.'[39]

In the lower palaeolithic context at Paisra, Pant and Jayasawal make a distinction between the camp-base and resource-base areas. The Paisra valley as a whole is about 18 sq km, whereas the actual concentration of

artefacts is noticed only over 2 sq km around the Paisra village. The latter area has been called camp-base whereas the wider valley which contains sporadic artefact occurrences throughout formed the general resource base zone.

A good source of the possible range of animals sharing the landscape with prehistoric humans is, of course, the extensive series of Pleistocene fossil animals found in different areas. The ancestral forms of modern cattle (*Bos*), horse (*Equus*) and elephant (*Elephas*) abound, and along with them occur forms of buffalo, varieties of deer, nilgai (*Boselaphus tragocamelus*), wild cats including lions, tigers and panthers. Interestingly, in the upper Pleistocene fossils from Susunia in Bankura, West Bengal, there is lion and in the fossils from the Kurnool caves of Andhra there is rhino. Sheep/goat (*Ovis/Capra*) remains come from the upper Pleistocene contexts of the Kurnool caves and the upper Mahanadi valley. Ostrich roamed the grasslands of Maharashtra and Madhya Pradesh and, possibly, parts of Rajasthan. The richness of the Indian fauna was impressive even 50 years ago, and looked at from this perspective, one can only marvel at the possible range and density of animals sharing the prehistoric landscape with humans. It would be interesting to know more about the Pleistocene background of the present day living higher plants of the Indian region (exceeding 21,000 species, which is more than one-tenth of the total number of species in the world). The blue pine (*Pinus wallichiana*) is supposed to have arrived early in the Pleistocene, and out of the immigrant *Cedrus libanica* from west Asia emerged during this period the most majestic of trees in the Himalayas, the *Cedrus deodara*.[40]

## The Evidence of Art (?)[41]

A close study of the total evidence has been made recently by R.G. Bednarik, and it should be useful to follow his discussion. The earliest evidence is from Bhimbetka site III.F-24 which is basically a tunnel (*c.* 25 m long) widening into a hall. A large rock in its centre contains, on its flat vertical wall facing the passage coming in from the main entrance of the tunnel, seven cupules or small cup-shaped depressions, up to 16.8 mm deep and preceding the present surface deterioration of the rock face. Further, a huge boulder uncovered in an excavation pit near this rock carries a single large, well-shaped and circular cup mark with an adjacent meandering line above. According to Bednarik, who has also examined the archaeological stratigraphy in relation to this boulder found in an excavation pit, neither this line nor the cupule is natural. He locates the cup mark and the meandering line roughly at the interface of the Acheulian with the

middle palaeolithic levels and considers it more likely to have been made during the Acheulian rather than the middle palaeolithic. Bednarik further points out that such cup marks occur at the site of the presumably later rock-art site of La Ferrassie in France. The rest of the lower palaeolithic evidence is tentative: a stone disc from Bhimbetka, a similar disc from the Acheulian site of Maihar (also in Madhya Pradesh), six small quartz crystals in a similar context at Singi Talav in the Didwana area of western Rajasthan, and more definitively, a red ochre piece (1 cm across) from the locality V at Hunsgi. Both rock crystals and ochre pieces are known from palaeolithic sites outside India. None of the evidence cited is strictly art but certainly suggests a level of cognitive awareness in the lower palaeolithic.

The evidence is more explicitly artistic in the upper palaeolithic stage in India as it is elsewhere. The late V.S. Wakankar, the premier student of prehistoric art in India, used to argue that the earliest level of superimposed paintings at Indian rock-art sites was done in green and that 'green earth' was found in the upper palaeolithic context at Bhimbetka site III.A-28. The opinion is by no means undisputed but the issue is not yet settled either. There are, however, two indisputable pieces of upper palaeolithic evidence: an engraved ostrich-shell fragment from Patne in Maharashtra, with two banded panels of criss-cross designs; and a somewhat damaged bone object dug out of the Belan valley upper palaeolithic gravel (Gravel III, bracketed roughly between 25,000 and 19,000 BP) at Lohanda Nala. Originally identified as a mother goddess figurine, this has been identified by Wakankar and Bednarik as a harpoon. Bednarik also points out that such harpoons also occur in similar contexts in Africa and Java and 'provide cogent evidence of a highly sophisticated tradition of bone working in the upper palaeolithic of India'.

## Concluding Remarks

The palaeolithic stage marks the most visible interface between geological and historical research. Here the earth sciences provide the basic framework of archaeological investigations, and, as we have seen, knowledge has significantly progressed in this field in India only where earth scientists have collaborated with archaeologists. One hopes that the trend will continue and develop, because behind this apparently silent mass of palaeolithic stone tools lies the history of India of about two million years. This history ends only ten to twelve thousand years ago, and from this point of view, what follows after that is only recent history!

Those who are familiar with the ubiquity of palaeolithic remains in the

subcóntinent are well aware that they occur virtually in all eco-zones, if not in all, but certainly in most of them outside the major alluvial deposits between Baluchistan and the western borders of Bangladesh and perhaps Manipur, and between Ladakh and the Palghat area of Kerala. Our ancestors knew about the suitability of different types of local stones as raw materials for their tools and where such stones were not available, as was the case in Tripura and Bangladesh, they settled for a suitable type of fossil wood. They certainly knew the terrain they were living in: in the Kortalayar plain they got raw material from about 4 km away and at Hunsgi they were aware of the ochre pieces they could gather in the local geological outcrops. They had to know about the local food and water resources and pattern their activities accordingly. They were the first explorers of the Indian landscape; in many parts of India their presence is very close to us—on hill-tops and slopes, in jungles and plains, on the banks of the water-courses, on the outcrops of raw materials, and in numerous cliff profiles where they lie embedded. By the time we reach the upper palaeolithic stage, their occurrences become more profuse and the tools more diverse and beautiful. There is a lot of beauty on nicely and assuredly flaked Acheulian handaxes too, but the sheer dexterity of flaking, detaching blades from blade-cores, retouching and choice of raw materials gets rather exciting in the upper palaeolithic. The fact that some of these techniques continued in the later periods shows the contribution made by these people towards the elaboration of technology. Large spreads of upper palaeolithic tools and related debris are a common feature of the landscape in many areas of the land, the Damin area of the Rajmahal hills being one of them. Very few of these spreads have yet been excavated.

As we get back to the lower palaeolithic, one of the burning questions is the evaluation of south Asia as a geographical zone in the overall scheme of human evolution. All that we know on the basis of the Hathnora evidence is that the region was within the distribution area of archaic *Homo sapiens*. What went on earlier and later is, of course, still unknown.

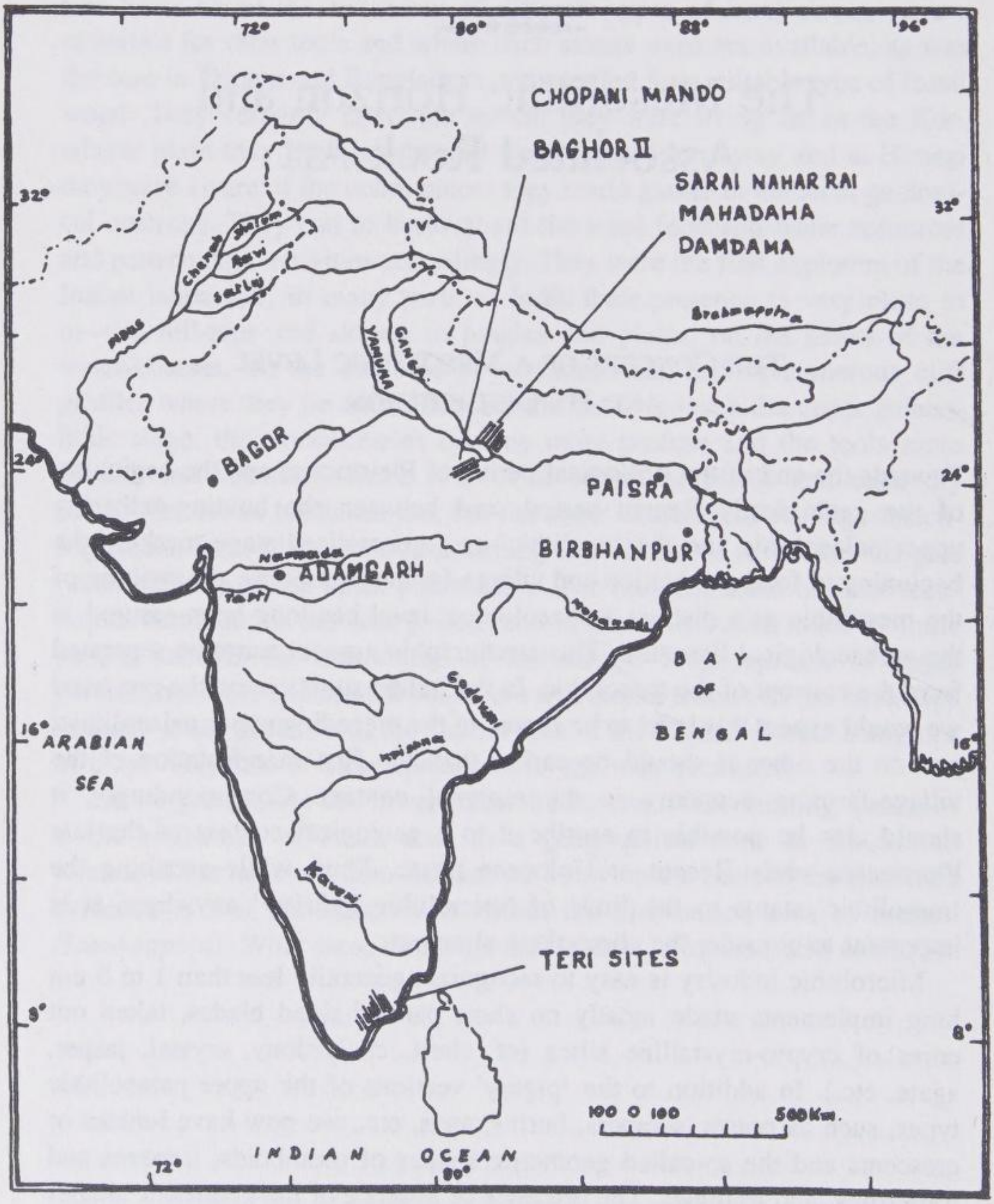
# III

# The Mesolithic Horizon and Associated Rock Art

## The Concept of a Mesolithic Level and Its Distribution

Towards the end of the geological period of Pleistocene and the beginning of the geologically Recent period, and between the hunting-gathering upper palaeolithic and the 'neolithic' or a generalized stage marking the beginning of food-production and village-farming economy, the position of the mesolithic as a distinct archaeological level has long been assured in the archaeological literature. This stratigraphic aspect cannot be separated from the concept of the mesolithic. In the Indian situation, on the one hand we would expect this level to be rooted in the preceding upper palaeolithic, and on the other it should be earlier than the first manifestation of the village-farming economy in the regional context. Correspondingly, it should also be possible to ascribe it to a geological context of the late Pleistocene–early Recent or Holocene phase. Thus, while ascribing the 'mesolithic' status to the finds of 'microlithic industry' anywhere, it is important to consider the chronological aspect.

Microlithic industry is easy to recognize: generally less than 1 to 5 cm long implements made mostly on short parallel-sided blades, taken out cores of crypto-crystalline silica (cf. chert, chalcedony, crystal, jasper, agate, etc.). In addition to the 'pigmy' versions of the upper palaeolithic types, such as points, scrapers, burins, awls, etc., we now have lunates or crescents and the so-called geometric shapes of rhomboids, trapezes and trapezoids, and triangles. The presence or absence of the geometric shapes establishes the status of a particular microlithic industry as geometric or non-geometric. As far as the presently available evidence goes, the latter




*This map is neither accurate nor to scale*

Map 2 Some Important Mesolithic Sites

may be earlier than the former in a particular sequence, but geometric type by itself need not be taken as indicative of a late assemblage. In both cases, the tools are too small to be effective as single specimens, although exception may be made in the case of those which could be used as arrowheads and drill-points. They were mostly hafted into handles of wood or bone and formed composite implements, such as saws, sickles, etc. Actual specimens of such implements made by hafting microliths in a handle have been found in suitably preserved archaeological situations.

That the Indian microlithic industry is rooted in the preceding phase of upper palaeolithic industries is proved both by the continuation of the archaeological stratigraphy from the upper palaeolithic into the microlithic and the development of the latter category of tools from the former category. The element of stratigraphic continuity is clear from all areas and localities where a full prehistoric profile from the palaeolithic to the mesolithic is available. The continuity of lithic technology is apparent too, wherever a close study of the lithic assemblages of both the upper palaeolithic and the mesolithic has been made. Patne in the Chalisgaon area of Maharashtra is an excavated site where such a study has been made. Of the five stratigraphically defined phases ('a' to 'e') of the upper palaeolithic at Patne, the last phase—'e'—is important from this view-point. The presence of backed, pen-knife and truncated varieties of blades along with lunates, triangles and trapezes in this level clearly foreshadows the development of the full-fledged microlithic industry of the succeeding phase. The excavator of the site, S.A. Sali, emphatically notes the 'Microlithic character obtained in the Late Upper Palaeolithic'. It may also be noted that there is a radiocarbon date of 23,050 ± 200 BC from the preceding phase 'd' of the upper palaeolithic and thus the upper palaeolithic phase 'e' which contains distinctly microlithic tool-types undoubtedly belongs to the end Pleistocene.[1] Again, the situation is hardly unique. There is a consistent series of radiocarbon dates between *c.* 26,000 BC and *c.* 9,500 BC for geometric microliths at the site of Batadomba–Lena in the area to the west of the central highland zone of Sri Lanka. Another area in the subcontinent where a case may be made for the end Pleistocene date of microlithic tool-types is near Tuticorin in the extreme south-east. Here a series of microlithic tool-types (backed blades, obliquely blunted blades, scrapers, triangles, points (including bifacial points of a type found also in Sri Lanka), lunates, etc. were found associated with red sand dunes which are locally known as *teris*. This industry is thus known as *teri* industry. According to Rita Gardner, who made a geomorphological study of the fossilized sand deposits of this area, the *teri* sands were 'weathered in the very Late Pleistocene and Early to Mid-Holocene'.[2] Although Gardner

is of the opinion that the microliths here only post-date dune formation and 'are co-incident with dune weathering', the position is by no means settled. For instance, K.V. Soundara Rajan writes that 'the implements, heavily stained with red hydrated ferric oxide, seemingly came from within the weathered sand of the original soil sections and are therefore likely to be older than the *teri* accummulation, certainly older than the red weathering'. More work in this area is certainly necessary. Further, it is important to refer to the level 6 (from the bottom) of 'lithostratigraphic sequence' in the middle Belan valley, studied by Williams and Clarke: 'brown and yellow-brown calcareous clay loam and sandy clays . . . Upper Palaeolithic to Epi-Palaeolithic and (?) Mesolithic artefacts. Age late Upper Pleistocene (*c.* 25 to *c.* 10 kyr BP)'.[3] The epi-palaeolithic level of this area, as defined by G.R. Sharma and others at Chopani Mando, contains an industry of backed blades, parallel-sided blades, burins, points, scrapers, cores, flakes and blanks which are smaller than the same type of upper palaeolithic artefacts but longer, thicker and broader than the true mesolithic artefacts. In the Belan valley the emergence of microliths towards the end Pleistocene is a clear possibility.

If the picture of the earliest emergence of microliths in India is slowly falling into place, there is no such clarity about their last limits. They certainly occur widely till the early Iron Age levels, which is not an uncommon situation even in Iron Age England. In certain areas, however, the use of microliths could have continued till the early medieval context. The early historic level of Dihar in Bankura, West Bengal, supposedly contains microliths made of bottle glass and in the same region lithic specimens have been found in association with *c.* tenth to twelfth century AD pottery. The tradition of making microliths out of bottle glass has been documented in the Andaman Islands in the nineteenth century. In fact, undated microlithic contexts in India do not denote a mesolithic phase. Myriads of surface clusters of microliths in the subcontinent are undated and thus cannot be put in a specifically mesolithic context. It is for this reason that a recent reviewer has written that 'normative views of "the Mesolithic" as a distinct phase of South Asian culture history be critically examined—and possibly abandoned.'[4] We do not propose to abandon the phase but also do not propose to use it as a holdall in which chronologically uncertain evidence of microliths and evidently copper and iron related evidence of these tools can all be put together with those sites which fall indisputably towards the end of the Pleistocene and in the early part of the Holocene or Recent. Our emphasis will only be on the chronologically secure or at least probable 'early' evidence.

Although the distribution of early, truly mesolithic evidence in India is

still limited, the distribution of microlithic sites is not; in fact, it is easier to note the areas without microliths than those with them. Except in a limited section of the Ganga plain, i.e. part of a strip between Pratapgarh and Banaras, microliths are not yet known to occur elsewhere in the Indo-Gangetic plain. The hilly areas of the north-east too have not yet revealed any categorical proof of the existence of this industry. Otherwise, microliths are more ubiquitous than palaeoliths in the sense that they are far more visible in the landscape. One comes across whole tracts full of microlithic scatters. It is mainly in the context of his microlithic finds in central India, eastern Vindhyas and near Banaras that Carlleyle wrote:

> The question now, therefore, is not—'where are stone implements to be found?' but rather—'where are they not to be found?' For, as far as my own experience goes, they appear findable almost eveywhere in India . . . .[5]

The modern population explosion has, however, destroyed many microlithic clusters in many areas of the subcontinent.

### *Climate*

The picture of climate at the end of the Pleistocene and the beginning of the Holocene is, despite claims to the contrary, not uniform all over the subcontinent. If we begin with the area near Santiniketan in West Bengal, we find that the trend was towards comparative dryness and semi-aridity. On the basis of the mechanical analysis of fine particles, microscopic examination of sand-grains and chemical analysis of the relevant soil samples from the excavated site of Birbhanpur at Durgapur in West Bengal, Dr B.B. Lal, the chief archaeological chemist of the Archaeological Survey of India, noted that the pre-microlithic and non-implementiferous layers of this site 'were produced under conditions of large quantities of moisture and a high mean annual rainfall with a downward percolation of water', whereas the microlith-bearing layer marked a comparatively dry period with increased wind activity. The climate 'tended more and more towards semi-aridity' in the post-microlithic period. On the basis of his work at Paruldanga in Santiniketan, the present author may further claim that microliths are found not merely on the surface of the earlier deposit of lateritic conglomerate which has yielded lower to upper palaeolithic tools in its main profile elsewhere in West Bengal but also within the sandy deposit which covers the lateritic conglomerate deposit. Even without being a geomorphologist one can infer that this sandy deposit could have been lain in that area by strong winds in an arid or semi-arid phase.[6]

The picture obtained from the coastal dunes of the eastern coast of

Andhra and Tamil Nadu is still uncertain. The deposition of these dunes over 25 km or so away from the present coastline occurred, according to Rita Gardner, towards the end of the Pleistocene and denoted 'the existence of significantly more arid conditions than at present'. However, according to her, the weathering of these dunes, which gave them their red colour, suggests 'the re-establishment and strengthening of the monsoon circulation during the Early to Mid-Holocene and the associated wetter conditions'. We have noticed that a different assessment of the position of the *teri* microliths puts them before the weathering stage, and from this point of view, the microlith-related phase of the dunes fell into the phase of arid conditions.

In the Didwana sector of western Rajasthan, the hypothesis of aridity during the terminal Pleistocene and greater rainfall in early Holocene has been put forward with great vigour. The detailed geochemical studies of the Didwana salt lake sediments and the study of their pollen deposits have been taken to suggest that 'towards the end of the Pleistocene the lake was carrying water only intermittently and depositing sandy sediments. From 6000–4000 BP 'the lake was almost perennially full suggesting a marked increase in rainfall'. If this interpretation of the relevant scientific research by Misra is correct, we do not have increased rainfall in this region before *c.* 4000 BC. The Holocene or Recent stage is supposed to have begun around 10,000 BP /8000 BC, and thus the onset of the Holocene in western Rajasthan cannot really be taken to be anything other than a phase of aridity. However, nothing in the area of palaeoenvironmental studies seems to be a cut-and-dried affair, as V.M. Meher-Homji's table of 'chronological sequence of aridity and humidity in Rajasthan' seems to demonstrate. To a large extent this table is based on the reconstruction of pollen profiles of the Salt Lakes of western Rajasthan by Gurdeep Singh and his associates, and for the earlier portion it depends on the premises put forward by Bridget Allchin and others.[7]

TABLE III.1

*Chronological Sequence of Aridity and Humidity in Rajasthan*

(adapted from Meher-Homji, 1980)

| | |
|---|---|
| Pre-Middle Stone Age | major dune formation—major dry phase |
| Middle Stone Age | phase of deep weathering—humid phase |
| Upper palaeolithic (pre-8000 BC) | dunes cover lake basins—severe dry phase |
| *c.* 8000 BC to *c.* 7500 BC | pollen sequence from the Rajasthan lakes indicates a moist phase |

| | |
|---|---|
| *c.* 7500 BC | vegetation burning by man—Cerealia-type pollen |
| *c.* 7500 BC to *c.* 3000 BC | comparatively poor plant cover—a drier phase |
| *c.* 3000 BC to *c.* 2000 BC | steppe-savannah type grassy vegetation—a moist phase |
| *c.* 2000 BC | Lunkaransar lake (W. Rajasthan) starts drying up—onset of aridity |
| *c.* 1800 BC to *c.* 1400 BC | Sambhar lake begins to turn saline—spread of aridity |
| *c.* 1400 BC to *c.* 1000 BC | slight amelioration in climate |
| *c.* 1000 BC | aridity |
| Early centuries AD to the present | aridity |

This profile no doubt suggests aridity towards the end of the Pleistocene but the beginning of Holocene here is marked by a moist phase, although for only 500 years. One has also to note that on the basis of his later palynological work in the Didwana lake Gurdeep Singh added more precision to this sequence.

TABLE III.2
*Climatic and Vegetational Sequence of the Didwana Lake, Western Rajasthan*
(after Singh, Wasson and Agrawal, 1990)

| | |
|---|---|
| Pre-12000 BC | arid steppe |
| 12000 BC–5510 BC | shrub, savannah grassland (i.e. climate wetter) |
| 5510 BC–4420 BC | savannah grassland |
| 4420 BC–2230 BC | sub-humid conditions |
| Post-2230 BC | semi-arid savannah grassland[8] |

Archaeologically, these profiles from western Rajasthan are significant mainly because of two reasons: the inference of a wetter condition as compared to the earlier conditions towards the end of the Pleistocene and the beginning of the Holocene, and the premise of a wet, sub-humid condition during the period which broadly coincides with the Indus civilization and related sites. We shall examine the second premise in a later chapter. Meanwhile, we note that there is no specific hypothesis of aridity in the beginning of the Holocene in western Rajasthan. This is what is relevant to our present discussion.

Williams and Clarke, who have studied the Quaternary sequence in eastern Madhya Pradesh, subscribe to the opinion that 'the Early to Middle Holocene climate of India was generally wet and warm, with heavy monsoonal rain in summer and moderate rain in winter. By about 4–3 kyr BP the Late Holocene desiccation of northern India was under way, aggravated by the impact of Neolithic herding, land clearance and cultivation.' In their overview of 'marine sediments and palaeoclimatic variations since the Late Pleistocene' in the Arabian Sea region of the subcontinent, R. Nigam and N.H. Hashimi report that the sediment characteristics on the western shelf of India and their mineralogical parameters indicate climatic aridity around 11 kyr BP (i.e. about 9000 BC) and that 'the climate changed from warm and arid to warm and humid around 10 kyr ago', accompanied by the intensification of the monsoon. Better monsoon conditions have been inferred to have existed prior to 3.5 kyr BP in the central Western Ghats where there was a reduction in evergreen, deciduous and mangrove forests and a corresponding increase in the savannah grasslands. However, as C. Caratini, who did the concerned palynological study, and Meher-Homji point out, this vegetational change could also occur due to human interference in the vegetation and need not be the result of any basic climatic change.[9]

Thus, the story of climate in the early Holocene and Holocene in general in the Indian subcontinent is not particularly well understood beyond some stray patches of scientific research. As far as the early mesolithic evidence is concerned, there does not seem to be any special reason to believe that the corresponding landscape was much more wet and wooded than what used to be the case over a large part of India before the population explosion and the consequent denudation of vegetation within the last hundred years. As Nigam and Hashimi point out, 'the reconstruction of palaeoclimatic variation over the Indian region during the last few thousand years is still in its infancy.' Attempts to understand the history of the geologically Recent Phase of India in terms of ill-established hypotheses of minor climatic oscillations display no doubt enthusiasm on the part of the authors of such attempts to take environmental factors into consideration to explain cultural changes, but regrettably, very little else.

### *Chronology*

Unfortunately, the number of early mesolithic dates from India is woefully limited and confined to a handful of sites. This amply indicates the limited amount of research which has been carried out on this phase of Indian history.

If one studies the following list of early mesolithic dates, one may justifiably put the first phase of the Indian mesolithic between 10,000+ BC and

*c.* 5,000–4,000 BC. There is some consistency in this spread of dates in Rajasthan, Madhya Pradesh, Uttar Pradesh and Bihar. There are also many late dates from other apparently mesolithic contexts. For instance, the Lekhahia rock-shelter in the eastern Vindhyas has three seventeenth century AD dates from the phase 4 of its mesolithic occupation. (However, more recent [unpublished] dates from the site show an early spread.) Either these dates are based on contaminated samples or indicative of a very late continuation of the use of microlithic tools in this area. In the present context we have ignored such dates and also the third to fourth millennia BC dates from the metal-bearing but otherwise mesolithic levels of such sites as Langhnaj in north Gujarat and Bagor in Rajasthan.

TABLE III.3

*Early Radiocarbon Dates from the Indian Mesolithic*

(after Possehl, 1994)

| | |
|---|---|
| *Adamgarh* (near Hoshangabad, Madhya Pradesh) | 5505 ± 130 BC—calibrated, true historical date range of this radiocarbon date, sample number TF-120, with single standard deviation: 6179–5960 BC |
| *Bhimbetka* (near Bhopal, Madhya Pradesh) | 5845 ± 215 BC (PRL-17)—calibrated range 6556–6177 BC; 4085 ± 115 BC (PRL-50), calibrated range 4895–4580 BC |
| *Baghor* (near Sidhi, Madhya Pradesh) | 6385 ± 225 BC (PRL-714), calibrated range 7416–6622 BC; 3515 ± 95 BC (SUA-1422), calibrated range 4246–3991 BC |
| *Bagor* (near Bhilwara, Rajasthan) | 4480 ± 205 BC (TF-786), calibrated range 5418–4936 BC; 3840 ± 130 BC (TF-1007), calibrated range 4575–4344 BC |
| *Mahagara* (near Meja, Uttar Pradesh) | the relevant dates are from 'cemented gravel IV' which is a transitional phase between the upper palaeolithic and the mesolithic and may mark the beginning of the mesolithic of the region: 8175 ± 165 BC (BS-131), calibrated range 9253–8965 BC; 8080 ± 120 BC (SUA-1421), calibrated range 9049–8741 BC; 12,200 ± 410–390 BC (PRL-603, no calibration necessary); 9945 ± 185 BC (BS-130), calibrated range 11,748–11,320 BC; 9360 ± 195 BC (PRL-602), calibrated range 11,135–10761 BC |
| *Sarai Nahar Rai* (near Pratapgarh, Uttar Pradesh) | 8400 ± 115 BC (TF-1104), calibrated range 9958–9059 BC |
| *Paisra* (near Munger, Bihar) | 5695 ± 115 BC (BS-675), calibrated range 6377–6067 BC |

Here we are concerned only with the earliest evidence of mesolithic economy in the subcontinent and not with its continuation. However, as we go through the cultural evidence in the next section, we shall have to wonder if at places such as Bagor and Adamgarh we have a pristine mesolithic economy or something different.

## CULTURAL EVIDENCE[11]

### *Bagor, Phase 1*

The site of Bagor, excavated principally in 1968–70, lies on top of a prominent sand dune about 25 km west of the town of Bhilwara in Rajasthan and overlooks the Kothari river which retains water only during the monsoon. Though there are fertile stretches along the river depressions, basically it is a dry country (60–75 cm of annual rainfall) with widespread rocky outcrops. The excavated trenches on top of the dune could not establish any profile of layers, but three phases of occupation have been determined on the basis of cultural materials: exclusively microliths in phase 1, the presence of copper with microliths in phase 2, and the presence of iron with microliths in phase 3. Phases 2 and 3 do not concern us here. Slabs of schist quarried from across the river were used to make large floors in phase 1, and in places there were roughly circular (3–5 m in diameter) alignments of stone which possibly marked the outer periphery of wind-breaks or flimsy huts. If these floors and outlines of wind-breaks marked the habitations, small areas (40–70 cm across) which were found to have been paved tightly with small stones and associated with concentrations of animal bones could have marked butchering spots. The lone burial site found in this phase yielded an extended skeleton with the lower part of its left arm resting on the body. There is no positive evidence of grave goods, but the excavator suggests that the few pieces of bone found in the vicinity may be associated with the burial, and if so, a few chunks of meat were placed with the dead. Out of the 'several hundred thousand worked pieces' of microliths found continuously through the three phases of Bagor, the 'greatest density' (45–55 per cent of the excavated material) is found in phase 1. The microlithic industry, which comprises shapes like triangles and trapezes and is thus of 'geometric' type, was based on 'the mass-production of micro-blades and their conversion into various microlithic forms'. Quartz and chert, both available locally, were the predominantly used raw materials. Isolated and small bits of pottery (1–2 cm in size) have been found associated with microliths but one cannot be sure if these bits formed original associations and are not later intrusions. At the same time, the possibility of original association cannot

be denied either. A few short, tubular and barrel-shaped beads made of banded agate, carnelian and garnet have been reported from phase 1, but again, doubts have been expressed about their original association. In the same context a few tiny bone beads have been reported too. Spherical stones which bear clear marks of being used could act as hammerstones in the manufacture of microliths, and pieces of red ochre suggest an awareness of colour. Fragments of shallow querns and rubbing stones have also been found, suggesting that the use of plants and seeds was known, although possibly of the wild variety. The density of excavated animal bones is highest in phase 1 and shows domesticated sheep/goat and cattle, along with wild cattle, two types of deer, pig, jackal, rat, monitor lizard, river turtle and fish, in the same phase.

There is an extensive distribution of microlithic scatters in the Mewar plain of Rajasthan, and the excavations at Bagor have indicated the possible way of life behind them in the sixth millennium BC and later.

### *Adamgarh*

The Adamgarh hill, about 2 km south of the Narmada at Hoshangabad, has naturally formed rock-shelters and a thick forest. The deposits associated with a rock-shelter were excavated in 1961, leading, among other things, to the identification of microlith-bearing layers in the upper part of these deposits. There is no secure internal stratigraphy of the microlith-bearing level, but 'a detailed analysis of tools obtained from the successive levels' of nearly 1–3 m deposit indicates, according to the excavator, that 'the earlier microliths belong to the Mesolithic stage and the later ones show Neolithic–Chalcolithic affinities'. In view of the sixth millennium BC date from the earlier level and a second millennium BC date from the upper level which is also associated with neolithic–chalcolithic pottery, this is a logical hypothesis. As at Bagor, microliths are abundant at Adamgarh: 5000 tools and 250 kg of waste chips were found in one trench alone. The raw materials are mostly chert, chalcedony, jasper and agate and come from the nearby river-bed where chunks of these stones are available. Triangles and trapezes occur among more common tool-types of points, blades, awls, scrapers, burins, etc. and thus the microlithic industry has to be called 'geometric'. The animal bones found in the earlier level denote the presence of domesticated cattle, buffalo, sheep, goat, pig and dog. The wild varieties comprise hare, lizard, porcupine, horse or donkey and several types of deer.

### *Baghor II*

This site is near Maraoli village in Sidhi district, Madhya Pradesh, in the

Son valley. Of the six layers excavated here in 1980, only the layer below the surface soil yielded microliths, and there is evidence to suggest that the nodules of chert and chalcedony, which were used as raw materials for tools, were first heated for easy flaking. The overwhelming predominance of waste material (96.7 per cent of the total lithic material excavated) has made the excavators wonder if the finished tools prepared here were not used and discarded elsewhere. The finished tools include, although rarely, triangles and trapezes. Fragments of grinding stones are parts of the assemblage and there is at least one hammerstone. A few small circular pieces of stone, chipped around the circumference, could have been used as playthings by children. There are also a few pieces of haematite and ochre with rubbed off surface. One of the most important features of the site is the occurrence of post-holes (*c.* 15 cm in diameter), indicating the use of large sturdy posts to construct shelters which were possibly large, at least partially open, semi-permanent wind-breaks or sun-shades. Five or six such standardized shelters have been traced. Tabular pieces of stone (generally smaller than 10 cm across) could have been used as paving stones or more likely as sleeping or storage platforms, head-rests or hearths similar to those of the modern Sefar community pastoralists who visit the Son valley in winter. The processing of plant food is suggested by grinding stones. Particles of burnt clay and charcoal have been found. Three hoof marks left behind in the excavated soil at the site by a Sambar deer introduce us directly to the image of a Sambar walking through this transitory settlement of the seventh to eighth millennium BC.

### *The Excavated Sites in Uttar Pradesh: Chopani Mando, Sarai Nahar Rai, Mahadaha and Damdama*

Of all these sites only Sarai Nahar Rai possesses a radiocarbon date which can be used to date this site: 8400 ± 150 BC (calibrated range *c.* 9000 BC and earlier). A second date from the site is plainly contradictory: around 1000 BC or a little earlier. The earliest of the three old radiocarbon dates from Mahadaha is in the calibrated range of 2853–2347 BC. One of these dates, in fact, shows a much lower range of 1405–803 BC (calibrated). There is no radiocarbon date from Damdama and Chopani Mando. In fact, this is a situation where we have to justify the inclusion of these sites in the category of the early mesolithic in the Indian context.

The archaeological evidence itself does not suggest a late date. At Chopani Mando in the Belan valley, for instance, the excavations have shown a sequence from the 'epi-palaeolithic' to the 'advanced mesolithic or proto-neolithic', and considering that the transition from the upper palaeolithic to the mesolithic has been traced in this region around 9000

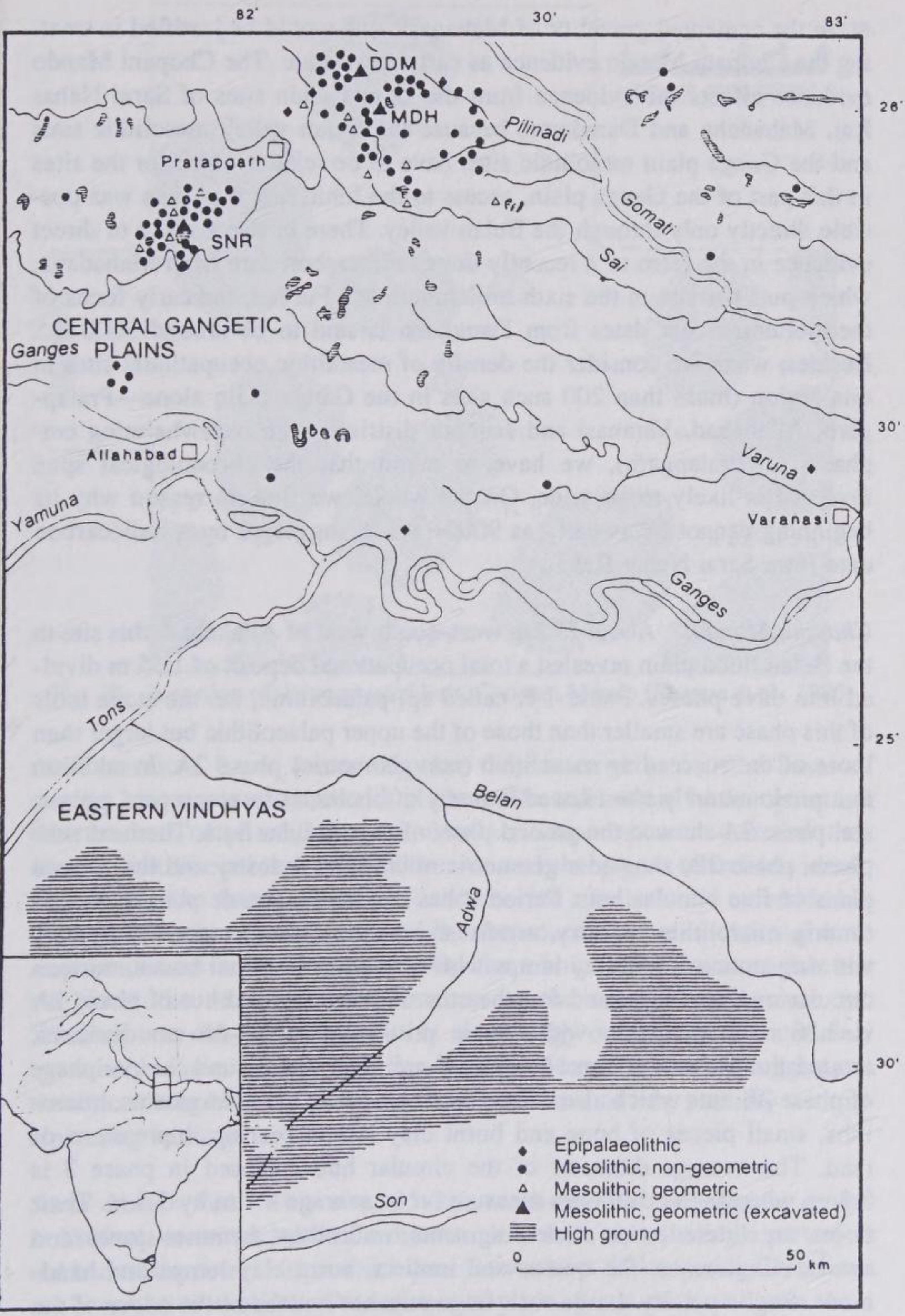



Fig. 9 General distribution of mesolithic sites in Uttar Pradesh (Chattopadhyay, 1996)

BC in the cemented gravel IV of Mahagara, one would be justified in treating the Chopani Mando evidence as early mesolithic. The Chopani Mando evidence affects the evidence from the Ganga plain sites of Sarai Nahar Rai, Mahadaha and Damdama, because the Belan valley mesolithic sites and the Ganga plain mesolithic sites have to be related, since for the sites in this part of the Ganga plain, access to the lithic raw materials was possible directly only through the Belan valley. There is also a piece of direct evidence in the form of a recently done radiocarbon date from Mahadaha, which puts the site in the sixth millennium BC. Further, the early focus of thermoluminescent dates from Damdama is said to be around 5000 BC. Besides, when we consider the density of mesolithic occupational sites in this region (more than 200 such sites in the Ganga plain alone—Pratapgarh, Allahabad, Varanasi and Jaunpur districts, with overwhelming emphasis on Pratapgarh), we have to admit that the chronological span involved is likely to be wide. On the whole, we find no reason why its beginning cannot be as early as 9000+ BC as suggested by a radiocarbon date from Sarai Nahar Rai.

*Chopani Mando:* About 77 km west–south-west of Allahabad, this site in the Belan flood plain revealed a total occupational deposit of 1.55 m divided into three phases. Phase 1 is called epi-palaeolithic, i.e. the stone tools of this phase are smaller than those of the upper palaeolithic but larger than those of the succeeding mesolithic (non-geometric) phase 2A. In addition to a predominantly chert-based industry of blades, borers, scrapers, points, etc. phase 2A showed the ground plans of two circular huts. The next subphase, phase 2B, showed a geometric microlithic industry and the ground plans of five circular huts. Period 3 has fragile handmade pottery, a continuing microlithic industry, anvils and hammer-stones, querns, mullers and ring-stones, burnt clay lumps with reed marks, animal bones, thirteen circular and oval huts, and four hearths. A fully exposed hut of phase 2A is 3.80 m in diameter, with twelve post-holes of 10–20 cm diameter, around the periphery. Stone fragments are observed around the periphery of phase 2B huts which also contain on their floors stone fragments, microliths, small pieces of bone and burnt clay lumps bearing impressions of reed. The average diameter of the circular huts exposed in phase 3 is 3.3 m, whereas the oval ones measure on an average 4.7 m by 3.3 m. Their floors are littered with stone fragments, microliths, hammer-stones and anvils, sling-stones, flat querns and mullers, burnt clay lumps and handmade, fragile pottery. Large rock fragments are noticed at the edges of the huts in some cases. The excavated hearths have all been found outside the huts and contain loose ashy soil. Outside the huts but quite close to them

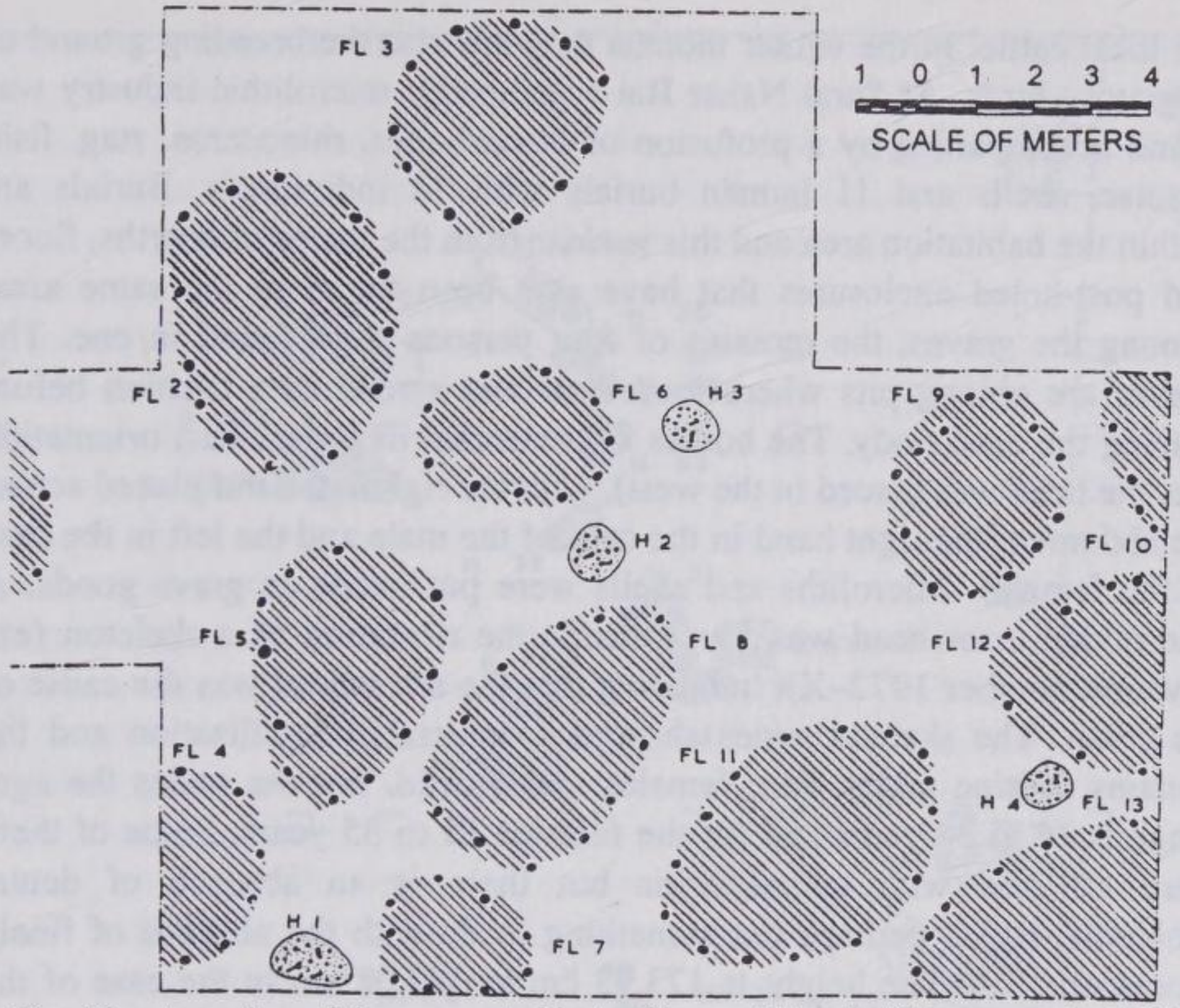



Fig. 10 A section of the excavated huts, Chopani Mando (Sharma et al., 1980)

the excavators found traces of what they inferred to be 'the bases of storage bins made of bamboo and clay'. The excavators further point out that the huts of phase 3 'are so closely situated to each other that they almost look like a bee-hive'. Wild cattle and sheep/goat have been identified among the bones of Phase 3 and charred rice is found embedded in the burnt clay lumps of this phase. Bamboo occurs either as charcoal or as impressions on burnt clay lumps. On the whole, the excavators date the site from the seventeenth millennium to the seventh millennium BC. Whether one can fully support this chronology or not, one can certainly agree with their opinion that the Chopani Mando evidence suggests 'a transition from hunting-gathering to settled mode of life, possibly with incipient agriculture'.

*Sarai Nahar Rai*: This site, 15 km south-west of Pratapgarh, covers *c.* 1800 sq. m on the bank of a dried ox-bow lake representing a part of an old bed of the river Ganga which now flows about 55 km south. Such lakes are common in the Uttar Pradesh countryside. Some of them retain monsoonal water throughout the year while others dry up in winter. In each case, however, they help irrigation, yield fish and provide rich fodder for

the local cattle. In the winter months they are also the breeding ground of migratory birds. At Sarai Nahar Rai a geometric microlithic industry was found accompanied by a profusion of bison bones, rhinoceros, stag, fish, tortoise, shells and 11 human burials with 14 individuals. Burials are within the habitation area and this is clear from the traces of hearths, floors and post-holed enclosures that have also been found in the same area. Among the graves, the remains of four persons were found in one. The graves are oblong pits where loose soil was spread as a cushion before placing the dead body. The bodies lay extended in a west–east orientation (i.e. the head was placed in the west), with the right/left hand placed across the abdomen (the right hand in the case of the male and the left in the case of the female). Microliths and shells were put inside as grave goods. A microlithic arrowhead was found inside the rib-bones of a skeleton (excavation number 1972–X), indicating that the arrowhead was the cause of his death. The skeletal series showed considerable fossilization and the remains of nine males, four females and a child. For the males the age-range is 16 to 34 years and for the females 15 to 35 years. Some of them were afflicted with osteoarthritis but there is an absence of dental problems, which perhaps has something to do with the absence of finely processed food. The height is 173.93 cm to 192.08 cm in the case of the males and 174.89 cm to 187.68 cm in the case of the females. They had large and robust skulls.

*Mahadaha:* The main area of this settlement, also on the bank of a dried-up ox-bow lake, measures 2400 sq m and the excavators demarcate three distinct areas here: the habitation-cum-burial area, the butchering area and the lake area. The 60 cm thick occupational deposit yielded 28 burials in four phases, with two cases of male–female double burials. In one case the female was placed above the male, and in another they lay side by side. Among the total of 30 individuals, 17 could be identified as males, seven as females and three as children. The grave pits are elliptical and slightly sloping, with a deliberately placed cushion of loose soil in some cases. The general orientation of the bodies is west–east; the grave goods include bone ornaments (inclusive of a necklace and a pendant), burnt fragments of animal bones, microliths, bone arrowheads and shells. The butchering area showed the remains of wild cattle, hippopotamus, varieties of deer, pig and turtle. Thousands of animal bones have been found in the lake area. The microliths are made of chert, chalcedony, quartz, crystal, agate and carnelian which were all brought from a distance of about 70–100 km in the Vindhyas. As at Sarai Nahar Rai, the people were tall (up to 190 cm in the case of the males and 162–176 cm in the case of the females). The

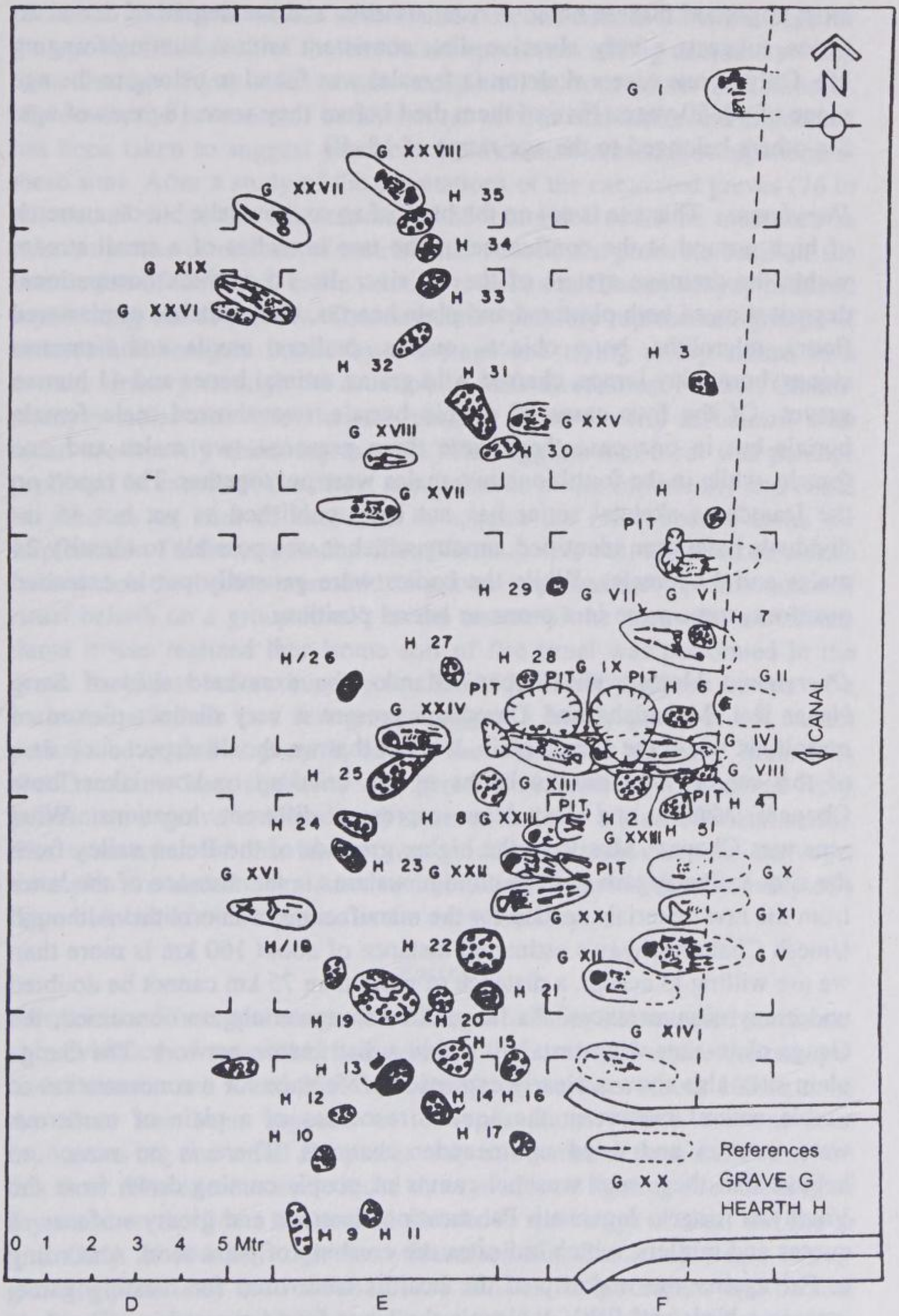



Fig. 11 Mahadaha excavations (Sharma et al., 1980)

most important disease noted is osteoarthritis, and the degree of dental attrition suggests a very abrasive diet, consistent with a hunting-foraging life. Only in one case a skeleton (a female) was found to belong to the age range of 40–50 years. Five of them died before they were 18 years of age. Six others belonged to the age range of 18–40.

*Damdama:* This site is not on the bank of an ox-bow lake but on a stretch of high ground at the confluence of the two branches of a small stream within the drainage system of the Sai river. Its 1.5 m thick occupational deposit showed both plastered and plain hearths, burnt patches of plastered floors, microliths, bone objects, querns, mullers, anvils and hammerstones, burnt clay lumps, charred wild grains, animal bones and 41 human graves. Of the four cases of double burials, two showed male–female burials but in one case there were three persons—two males and one female, while in the fourth one two males were put together. The report on the Damdama skeletal series has not been published as yet but 46 individuals have been identified, among which it was possible to identify 24 males and 17 females. While the bodies were generally put in extended positions, some were in a prone or lateral position.

*Overview:* Along with Chopani Mando, the excavated sites of Sarai Nahar Rai, Mahadaha and Damdama present a very distinct picture of mesolithic life in the Ganga plain. It is not that we should expect such sites of this region only on the banks of the dried-up ox-bow lakes; both Chopani Mando and Damdama represent different locations. What separates Chopani Mando in the higher grounds of the Belan valley from the sites in Pratapgarh and the contiguous area is the distance of the latter from the raw materials needed for the manufacture of microliths. Although Umesh Chattopadhyay's estimated distance of about 160 km is more than we are willing to accept, a distance of more than 75 km cannot be doubted under any circumstances. As far as the raw materials are concerned, the Ganga plain sites were certainly within a distribution network. The Ganga plain sites also show a clearly expressed preference for a concentration of usable natural resources: the aquatic resources of a plain of numerous water-courses and dried up meander channels. There is no reason to believe that they were seasonal camps of people coming down from the Vindhyan fringes. Jagannath Pal mentions lustrous and glossy surfaces of querns and mullers, which indicates the crushing of plant food. According to Pal again, 'the majority of the hearths were used for roasting game, including birds and fish'. A bison's skull was found charred in a hearth at Mahadaha where 'roasted food was probably placed on circular platforms,

plastered and burnt, which were found near the hearths.' On the basis of the age determination of the butchered specimens of hog deer and swamp deer Chattopadhyay inferred site occupation in both winter and summer. Moreover, the presence of bandicoot rat at both Mahadaha and Damdama has been taken to suggest year-round rather than seasonal occupations at these sites. After a study of the orientations of the excavated graves (76 in all, out of which the orientations of 55 examples could be measured in relation to the directions of sunrise and sunset, the probable basis of the orientation of these graves) in relation to azimuth, Chattopadhyay deduced a year-long burial activity. The mortuaries possibly represented groups of hunters and foragers bound by a lineage and trying to lay claims to a certain territory through the location of their mortuaries. Further, Chattopadhyay notes that 'the skeletal remains, more directly associated with meat, are heavily under-represented.' He suggests that meat was perhaps produced in excess of the direct requirements of the community and could be used as an item of exchange to acquire the much-needed stone for implements. Further, as Radha Kant Varma points out, the meticulousness with which the bodies were laid in graves 'represents the performance of ritual beliefs on a group level'. In the course of the excavations at Damdama it was realized that 'some sort of fire ritual was performed in the grave itself just before burying the dead.' Whether the joint burials of a male and a female in a few graves suggest a family group or not cannot perhaps be settled at present, but the fact that some burials at Mahadaha and Damdama bear skeletons with personal ornaments (cf. a carved ivory pendant in a grave at Damdama) seem to indicate a kind of social status. The orientation of the bodies was principally west-east but east-west examples are also known. Another interesting feature is the discovery of a large number of ochre pieces in the excavated layers.

### *Paisra*

Paisra in the Kharagpur range near Munger in Bihar has revealed unmistakable evidence of mesolithic habitation in its Locality F where the occupational remains are found 65–90 cm below the surface. About 105 sq m of this floor has been exposed in the excavations. There are traces of 'numerous big and small fire places only a few metres from each other' on this floor. The excavators deduced three modes of lighting fire: burning of dry wood on the floor; fire around and above wet lumps of clay; and fire in pits. Only 26 finished tools were found on this floor: one was a microgravette point and the rest comprised lunates, side-scrapers and backed blades. The raw material, i.e. stone, was probably heated before flaking. The excavators conclude that the extremely thin layer of mesolithic habitation at

Paisra suggests that people did not live at this place for a long time. No organic remains have been reported. However, this seventh millennium BC site provides the only evidence of an early mesolithic habitation in the whole of eastern India.

## Associated Rock Art

The occurrence of human and animal figures and different kinds of scenes painted or bruised on rock-surface in the Indian subcontinent has been known for a long time. In fact, more than a hundred years ago A.C.L. Carlleyle drew attention to some paintings in the eastern Vindhyas as being mesolithic. The main basis of his dating was the occurrence of microlithic material and pieces of red ochre in the painted rock-shelters of that area.

Lying along with the small implements in the undisturbed soil of the cave floors, pieces of a heavy red mineral colouring matter called *geru* were frequently found, rubbed down on one or more facets, as if for making paint—this *geru* being evidently of a partially decomposed haematite (iron peroxide). On the uneven sides or walls and roofs of many of the caves or rock shelters there were rock paintings apparently of various ages, though all evidently of great age, done in red colour

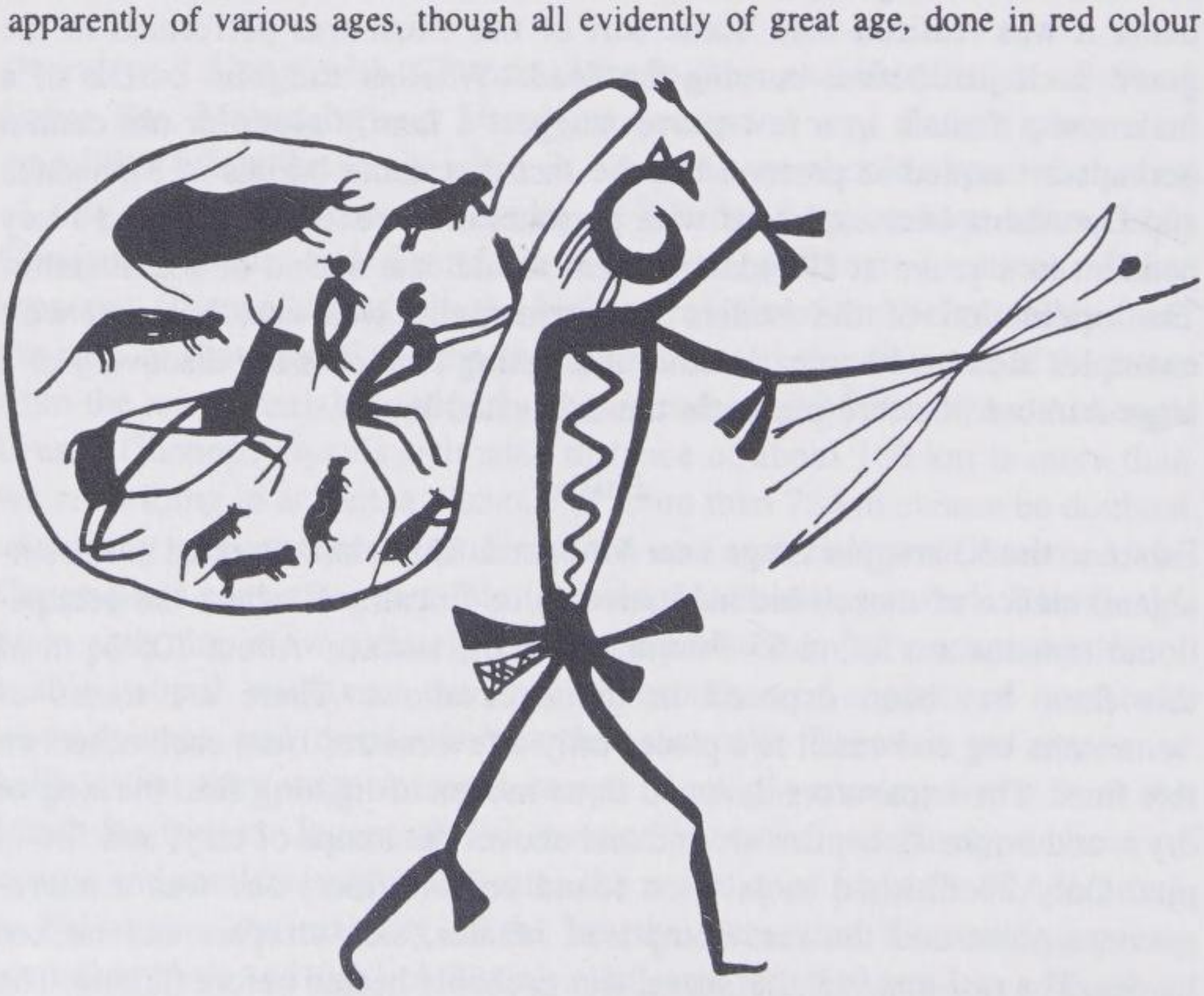


Fig. 12(a) Examples of rock painting (*Man and Environment 1989*)

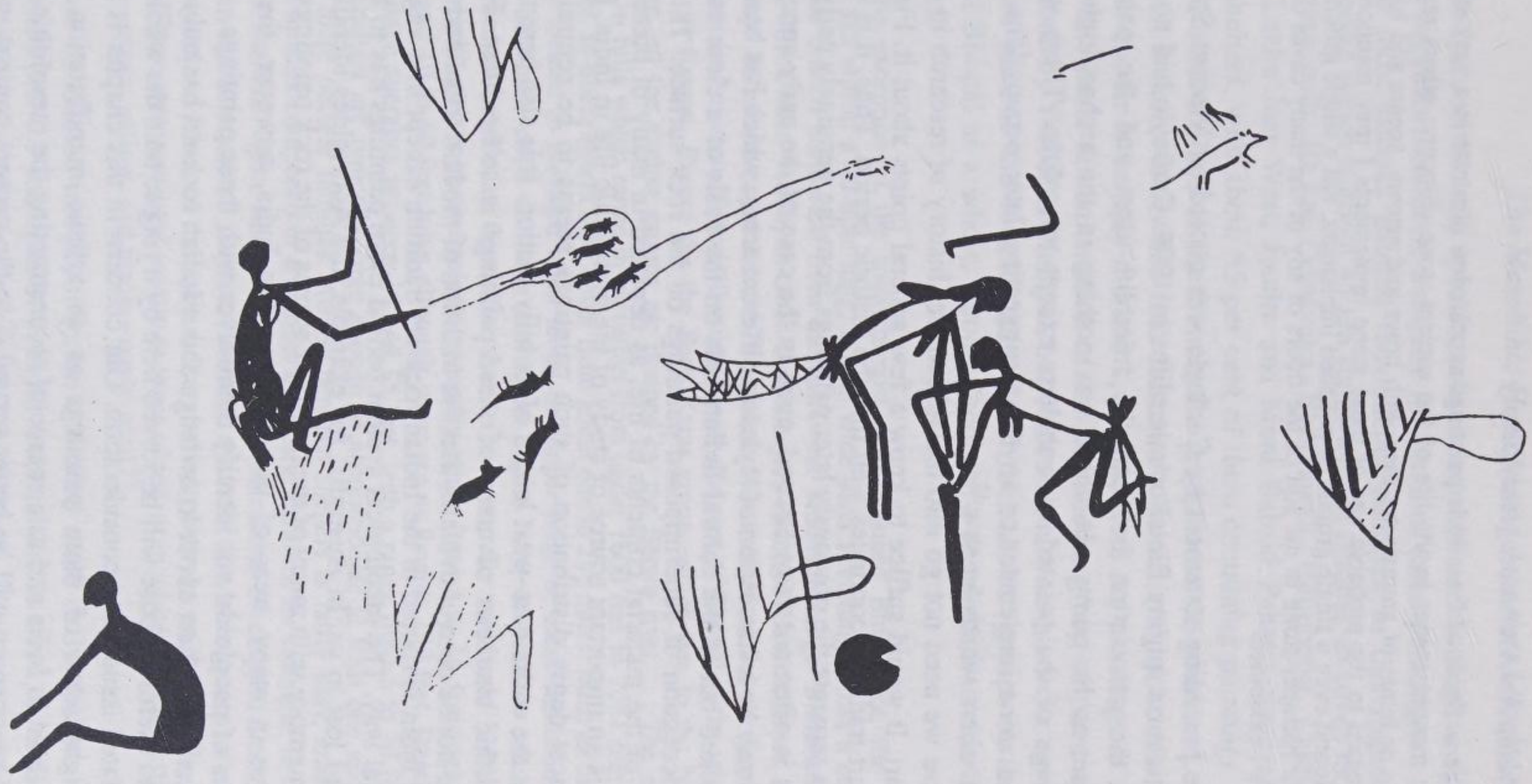


Fig. 12 (b) Examples of rock painting (*Man and Environment 1989*)

called *geru*. Some of these rude paintings appeared to illustrate in a very stiff and archaic manner scenes in the life of the ancient stone chippers; others represent animals or hunts of animals by men with bows and arrows, spears and hatchets. With regard to the probable age of these stone implements I may mention that I never found even a single ground or polished implement, not a single ground ring-stone or hammer-stone in the soil of the floors of any of the many caves or rock-shelters I examined.

The preceding statement by Carlleyle was quoted by Vincent Smith in his article on 'pigmy flints' or microliths in 1906. Carlleyle had no doubt about the association between the microlith-users and the paintings, because, as he points out, there was nothing in the archaeological assemblage of the painted rock-shelters except microliths. There was no ground stone implement or anything suggesting later occupations in the rock-shelters which he saw.[12]

Here we need not go into the subsequent history of research in Indian rock-art. It would suffice to know a few general points about it. First, the rock-art tradition continues well into the historic period. Thus, it is important to separate the obviously later paintings from the genuinely early ones, which is often not easy. Second, even in the case of the early specimens, there may be a succession of styles in different areas, which has been partly worked out in the central Indian hills on the basis of a close study of the succession of superimposed paintings on the rock surface. Third, the study of the material contents of life, as depicted in many of these paintings, is an important source of study of the mesolithic life in India. Fourth, the most dense distribution of such paintings seems to be central India, across the entire east–west length of its hilly section. It is also here that the mesolithic character of many of these paintings is self-evident. Fifth, it would not be correct to claim that the tradition of modern tribal and village art in India is rooted in the Indian rock-art tradition except in a vague and general way. The ideological system behind these paintings has to be considered lost to us. In Australia, for example, the Aborigines identify their folk memory with many of the motifs or scenes of the rock paintings which survive in many areas of that continent. In India, however, the living groups of people do not identify themselves with these paintings.

Systematization of our knowledge about Indian rock-art has only begun, and no useful purpose will be served here by trying to take the whole range of related issues into consideration. Our concern in this chapter is only to highlight some of these paintings as an artistic manifestation of the mesolithic in India and as a source of reconstructing the mesolithic way of life. Our purpose will be better served if in the present context we focus only on the paintings documented from the region around Bhopal in Mad-

hya Pradesh, with some specific reference to the archaeological situation which suggests mesolithic antiquity for some of these paintings.

The most famous painted rock-shelter complex in this region is at Bhimbetka which is about 45 km south-west of Bhopal. In seven locations extending over 10 km (Vinayaka, Bhonrawali, Bhimbetka, Lakha Juar East, Lakha Juar West, Jondra and Muni Babaki Pahari), there are 642 rock-shelters, with about 55 per cent of them containing paintings. There are 243 rock-shelters in the Bhimbetka group alone (marked as Location III; each location is divided into clusters A, B, etc. and each rock-shelter of each cluster is serially marked 1, 2 etc.); there are paintings in 133 of them. The basic documentation of the Bhimbetka group of paintings has been done by Yasodhar Mathpal, but before we turn to this work we should have an idea of the location of painted rock-shelter groups in the area around Bhopal as a whole. Jerome Jacobson's description is clear in this context.

> With the exception of the southernmost group, named Bhimbetka, the shelter groups fall within a 40-mile long, 8-mile wide band stretching across a series of hills that branch northward from the east–west Vindhyan range. Bhimbetka is a foothill of the main Vindhyan chain in Goharganj tahsil of Raisen district. Five of the groups lie within or just outside Bhopal, in Huzur tahsil of Sehore district; the other four lie between 20 and 40 miles almost due east of Bhopal in the tahsil and district of Raisen. Except for the Putli Karar group, which lies in the Narbada drainage, all the shelter groups are drained by the Betwa river. . . . The shelters cluster in hills which range in elevation from under 1600 feet to 2051 feet above sea level. In linear extent they cover from about one to 2½ miles. Most of the shelters are located in elevated cliffs along the upper ridge of these sandstone hills. Others lie under cliffs at lower elevations of the hills, or even in outcrops of sandstone on the plateau floor. The shelters are naturally weathered hollows. . . . Shelters with paintings or artefacts generally range from 4 to 16 feet high at the mouth and 10 to 60 feet long, although some are as long as 130 feet. Depth from the entrance averages between 10 and 15 feet, with a range from 5 to 30 feet. . . . These shelters are typically large enough to accommodate at least one and often two or more nuclear families. Access between shelters is fairly easy, enabling a band of hunters composed of a number of nuclear families, for example, to occupy adjacent shelters. Open sites, marked by concentrations of chipped stone, were found on the summits of slopes of most of the hills in which groups of shelters were located. . . . Most of the rock shelters reveal paintings on their walls, and/or ceiling. These were executed mostly in tones of red, or in white, or both, with other colours—green, yellow, and black—rarely used.[13]

Jacobson conducted test-probings on a limited scale in 39 shelters which established 0.6–0.9 m depth of cultural material inside them, with most of this material belonging to a microlith-using phase. He also test-pitted two open-air sites and undertook a comparative study between the microliths

found in the shelters and those found in the open-air sites. The most obvious difference lies in the relative proportions of blades and blade cores. In the open sites the blade–core ratio is 1 : 1 but it is 11 : 1 in the shelters. This may be explained by postulating the shelters as a home-base where many of the blades were used and discarded, whereas in the field (i.e. at the open-air sites) people would manufacture blades as the need arose and perhaps carry them back to the home-bases. This in turn suggests a kind of centre-based wandering pattern on the part of the microlith-users of this area. Further, the large number of shelters in each group might have permitted a central gathering of the wandering groups and collective ceremonial activities where paintings on rock would form a part.

In the Bhimbetka locality we notice that in the scheme of stratification attempted for the paintings of the area by Mathpal, there are only two broad periods—one showing scenes of a society of hunters and food-gatherers, and the other those of fighters riding on horses and elephants, using metal weapons, and of royal processions. There are some overlappings between these periods, but the first one is prehistoric or broadly mesolithic, while the second one is historic, covering the entire spectrum from the Maurya–Sunga (late centuries BC) to the post-Gupta periods (seventh century AD and later). In the prehistoric period, again, there are five successive phases—A, B, C, D and E.

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TABLE III.4

Stylistic Successions and Characters of the Prehistoric Paintings in the Bhimbetka Locality, Madhya Pradesh (after Mathpal, 1984)[14]

| | |
|---|---|
| Phase A | large animal figures outlined and partially filled in colour with geometric and maze patterns—26 drawings in this phase, wild buffalo, leopard, cow and elephant being the principal animals—the colours used: white, light red, dark red, raw sienna, dark crimson and purple. |
| Phase B | 1167 figures of both humans and animals—human figures in stick style and mostly masked—representing hunters chasing game with sticks, slings, bows and arrows, stone-tipped spears, large broom-shaped traps and even with bare hands—female figures more naturally drawn and shown participating in hunting expeditions—animal figures, drawn in generally natural style, are shown reduced in proportion—the inner space of the body filled with a variety of geometric and abstract figures, but there are only outlines as well—22 animal species (mostly deer and wild buffalo) represented. The colours used: light red, burnt sienna, crimson, sepia, purple, emerald green, scarlet, vermilion and yellow. |

Phase C large-sized silhouettes of humans and animals in natural poses—animals sometimes drawn in two colours—the inner portions of animal bodies left partially unfilled or filled with vertical, barbed and criss-cross lines—human figures shown naturally and holding bows and arrows and sticks. Principal colour white, but also light red, raw sienna, orange, burnt sienna, burnt umber, crimson, dark purple, vermilion and sepia. Mostly deer and cows—also prints of hands, lines, dots, colour patches and finger-tip dots. Women and children present.

Phase D stylized depiction of living objects. Out of 280 figures of this phase 183 human and the rest animals, dotted lines and coloured patches. The colours used: white, raw sienna, light red, dark red, burnt umber, crimson and sepia.

Phase E decorative figures—cf. buffaloes shown with long extended horns and bodies decorated in honeycomb, zigzag and concentric square patterns executed in creamy white. The first representation of mother-goddess—the principal colour used is creamy white, but also the use of burnt amber, burnt sienna, sepia, crimson and black.

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Once we set aside academic issues of distribution, chronology, phasing, colour schemes and styles of these paintings, we are confronted with a density of images which sharply convey the sense of a lost hunting-gathering world. The locales by themselves are very beautiful; the innate beauty of such landscapes has been juxtaposed by a world in which people collect food in the forests, hunt and trap animals and occasionally drink and dance with abandon, the warmth of which one can perceive in these paintings after all these years.

Academic issues, of course, cannot be sidetracked. It would be much easier to grapple with these issues if the type of documentation put at our disposal in the case of Bhimbetka by Mathpal were available from other areas. We would also need detailed studies on the locations of each of the painted shelter groups in different areas. Interestingly, some of the painting sites in the eastern Vindhyas seem to be aligned according to the orientations of the local routes. For instance, if one takes the general line of the main route to the Deccan from Mirzapur in the Ganga plain, one notices painted rock-shelters along the way once the rocky outcrops and plateaus begin to appear. Similarly, beyond Robertsganj, on the way to the Son valley and the Surguja area of Madhya Pradesh, one notices painted rock-shelters overlooking the way. The painted rock-shelter site of Bhuili lies on the straight route from the hills near Ahraura to Banaras, and some rockshelters have been recently reported on the direct route from Ahraura to the Sasaram area in Bihar. It is possible that the lines of movement of

mesolithic people in central India marked the alignment of what became historically recognized routes. The distribution alignment of such painting sites and historical routes is also clear from the way these sites have been found almost all along the Karakoram route in the Gilgit Agency of Pakistan.[15]

## Concluding Remarks

This chapter, it is hoped, would have succeeded in demonstrating that our knowledge of the early mesolithic in India amounts to very little: only eight excavated sites with proper occupational evidence and early dates in admittedly limited areas of Rajasthan, Madhya Pradesh, Uttar Pradesh and Bihar, and an assortment of rock paintings which still seem to be confined only to the central Indian highlands from Uttar Pradesh to Gujarat. Also, at least two sixth millennium BC sites among them—Bagor and Adamgarh—show domestication of cattle and sheep/goat and people might already have shed some of their hunting-foraging 'mesolithic' activities. On the other hand, we should never stop emphasizing the importance of 'mesolithic' hunting-foraging way of life in the context of Indian history and culture. For one thing, the microliths themselves continued to be used for longer periods here than possibly elsewhere; for another, some amount of hunting-foraging is still entrenched in the peripheries of modern Indian village life. In fact, anybody who knows the Indian countryside knows too that for about 2–3 months of lean non-agricultural season every year the landless labourers survive, at least partly, by foraging for edible roots, leaves, seeds and fruit which grow wild in the countryside. The modern population explosion is, of course, fast depleting this wild source of food in the Indian countryside. The mesolithic way of life in India is still far more important to us than we are willing to admit. Besides, some of our modern cult spots may well have a mesolithic background or ancestry. For instance, around the modern Shakti cult spot known as Kalkaji in a part of the Aravallis on the outskirts of Delhi, the only archaeological relics that one can pick up are microlithic flakes. Whether some of these modern cult spots have mesolithic ancestry or not is impossible to determine with satisfaction, but the possibility is always there. The mesolithic hunters and foragers who roamed the Indian landscape have left long enough shadows which still touch us in different ways. One hopes that future research will give it a far greater semblance of reality than has been possible in this chapter.

# IV

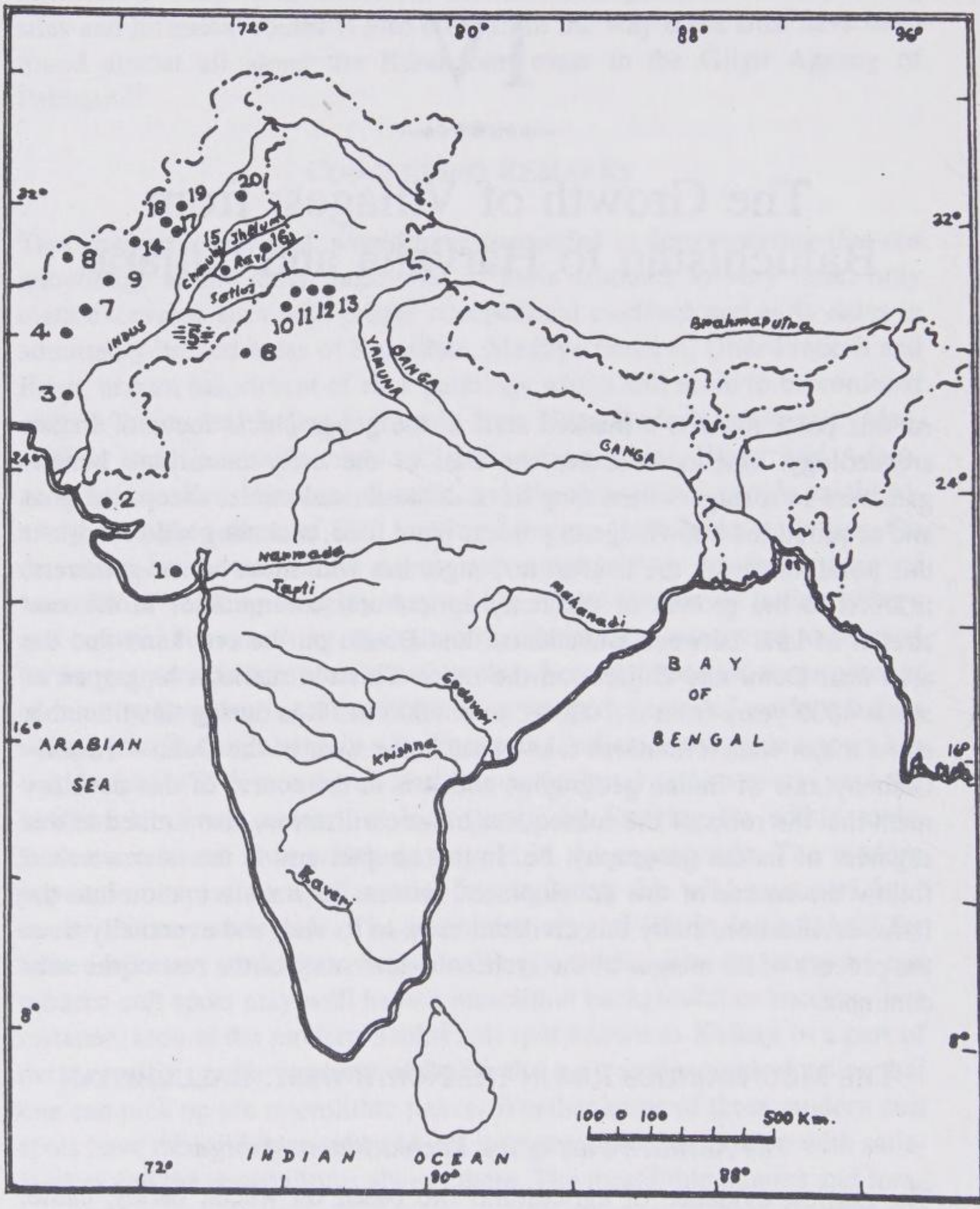
# The Growth of Villages: from Baluchistan to Haryana and Gujarat

At this point there is a marked shift in the geographical focus of Indian archaeology. One now leaves the trail of the early mesolithic hunter-gatherers in a stage where they have domesticated cattle, sheep and goat and acquired the knowledge to process plant food, including wild seeds. At this point, however, the interest no longer lies with these hunter-gatherers; it shifts to the growth of distinctly agricultural communities in the vast stretch of land between Baluchistan and Bannu on the one hand and the area near Delhi and Gujarat on the other. This too marks a long span of about 4000 years from *c.* 7000 BC to *c.* 3000 BC. It is during this time that some major transformations take place to the west of the Delhi–Aravalli–Cambay axis of Indian geography, and it is in the course of this development that the roots of the subsequent Indus civilization, also limited to this segment of Indian geography, lie. In this chapter and in the next we shall follow the course of this development, witness its transformation into the Indus civilization, study this civilization up to its end, and eventually trace the process of its merger in the archaeological story of the rest of the subcontinent.

## The Mountainous Rim in the North-west: Baluchistan

### *The Northern Part of the Kachhi Plain: Mehrgarh*[1]

The earliest evidence of agricultural life based on wheat, barley, cattle, sheep and goat in the subcontinent comes from the site of Mehrgarh on the bank of the Bolan river in the Kachhi plain of Baluchistan. Its convenient chronological point is *c.* 7000 BC. For the next two to three millennia the evidence of this type of agriculture seems to be limited to Baluchistan, although by the end of this period it is found spread all over




*This map is neither accurate nor to scale*

Map 3 Some Major Pre-Indus Sites. 1. Padri, 2. Dholavira, 3. Amri, 4. Nal, 5. Cholistan sites, 6. Ganeshwar, 7. Kalat sites, 8. Quetta sites, 9. Mehrgarh, 10. Kalibangan, 11. Kunal, 12. Banawali, 13. Mitathal, 14. Ranaghundai, 15. Jalilpur, 16. Harappa, 17. Rehman Dheri, 18. Gumla, 19. Sheri Khan Tarakai, 20. Saraikhola

its major areas, such as the Zhob valley in the north-east, the Quetta valley and the Kalat plateau in the central section, the Las Bela plain on the coast and the valleys in the hills which come down to it from the Kalat side, and the Kej valley to the north of the coastal ranges of Makran. The north-eastern section traversed by the Zhob and the Gomal lies between the Toba Kakar range on the Afghanistan side and the Suleiman range on the side of the Indus valley. The Quetta valley is associated with the Bolan pass, and from the south of the Kalat plateau veer away the major ranges of south and south-west Baluchistan. The eastern face of the province in this direction is blocked from the Indus valley by the Kirthar range. The coastline or the Makran coast is narrow and does not permit easy movement from the coast to the interior except along the mouths of a handful of rivers (cf. the Dasht and Shadi Kaur). Beyond this hill-girt coastline is the Kej valley, providing easy communication with Iran. The area between the Kej valley in the south and the Chagai hills in the north, which demarcate this part of Baluchistan from the Seistan area of Afghanistan, is marked by an extensive desert depression. Rainfall varies from about 10 inches annually in the hills to about 5 inches or less in the plains, and thus the archaeological discovery of early agriculture in Baluchistan has also raised the issue of its prehistoric climate. Nothing indicates a basic climatic change; in fact, the evidence of the use of modern *Gabarbands*, or walls to deflect rainwater coming down the hills and thus retain some of the associated silt, in the third millennium BC would argue against it. Moreover, the analysis of charcoal from the excavated sites of the Kachhi plain has led to the inference that 'vegetation has not changed in this area for ten millennia'.

Archaeologically, Baluchistan is a part of the interaction zone between the southern part of central Asia and the Indus valley. The cultural development in this overall area is bound to be reflected in the cultural development of Baluchistan too. In fact, after the discovery of extensive remains of painted pottery-using prehistoric cultures in the 1920s and earlier in Baluchistan, much of the archaeological literature concerned was devoted to finding analogues of these painted designs in the prehistoric pottery of Iran and central Asia. Although the archaeology of Baluchistan is at present based more on excavations than surface collections of painted pottery, and there is a valid case for studying the early agricultural development of Baluchistan on its own terms rather than in relation to Iran and central Asia, one has still to be aware of the range of interactions which were possible between the different components of the Oxus–Indus interaction zone. Considering the significance of the site of Mehrgarh and the general continuity of occupation here into the Indus civilization period,

it is important that we try to understand, however briefly, the geographical character and significance of its location. Mehrgarh and the Indus civilization site of Nausharo lie a little to the south-west of Dadar in the Kachhi plain. Sibi lies about 24 km to the north-east of Dadar. This area and the Kachhi plain as a whole extending in the south up to Jacobabad experience extreme heat, reputedly the highest in the subcontinent, in summer. However, from the irrigational point of view the area cannot be bad, because a publication of 1877 by A.W. Hughes clearly states that there is 'a good deal of cultivation around Dadar, and large quantities of wheat are grown in the valley, as also cotton, cucumbers and melons.' The same publication also refers to the 'large number of villages in Kachhi'. Numerous non-perennial water-courses—and this non-perenniality applies to the Bolan river as well—dot the Kachhi plain, and after the rains dams were put across their courses to make them overflow and make agriculture possible. Another important point is that this area is close to the entrance of the Bolan pass from the Indian side; Dadar is said to be only 8 km east of this entrance.

Excavations at Mehrgarh began in 1974 under the leadership of J-F. Jarrige and continued into the 1980s and later. The archaeological remains of different periods are spread over about 200 hectares of land on the banks of the river Bolan, and different parts of the site bearing evidence of occupation in different periods have been given separate numbers, such as MR 1, MR 2, MR 3, etc.

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TABLE IV.1

*Archaeological Sequence of Mehrgarh*

(after M. Lechevallier, 1984)

1. Period Ia–c: site number MR 3—excavated areas: houses—store rooms, cemeteries, open areas—main features: pre-ceramic occupation, unbaked clay figurines
2. Period IIa–c: MR 4—store rooms, cemetery, open areas—straw-tempered pottery, polished plain red pottery, first cylinder seal
3. Period III: MR 2—store rooms, open areas—painted pottery (animal designs), first direct evidence of copper-smelting
4. Period IV: MR 1—houses, open areas—painted pottery (geometrical decoration), terracotta female figurines
5. Period V: MR 1—pottery-firing area, children's cemetery—painted pottery (white pigment), first grey ware, human figurines
6. Period VI: MR 1—houses, open areas, pottery-firing area—black-on-grey ware, Quetta red ware, Nal polychrome pottery, compartmented stamp seals

| | | |
|---|---|---|
| 7. | Period VII: | MR 1—houses, store rooms, open areas, large platform—black-on-grey ware, late Quetta ware, Kot Diji ware, male and female figurines |
| 8. | Period VIII: | Sibri, south of Mehrgarh—cemetery, domestic structures, open areas, 'central Asian' pottery, shaft-hole bronze axe, cylinder seal |

The archaeological story of this part of the Kachhi plain does not end here. Another major segment is taken up by Nausharo, a site belonging to the Indus civilization, and Pirak which covers the transition to the Iron Age here. However, the present chapter is primarily concerned with the Mehrgarh Period I and partly with the nature of the evidence up to Period VI. The archaeological sequence listed above highlights the continuity of occupation in this region. Chronology of the different components of this sequence is not particularly clear-cut, but for the early periods (up to Period III) a scheme based on occasionally inconsistent radiocarbon dates has been offered by J-F. Jarrige: Period I—*c.* 7000/*c.* 6500 to *c.* 6000 BC and later; Period IIA—central point *c.* 5500 BC; Period IIB—central point *c.* 5000 BC; Period III—central point *c.* 4500 BC. For the later periods, there are some types of pottery which have also been found elsewhere and thus, it is possible to have an idea of the chronology of these periods through cross-dating. Mehrgarh is the only site in Baluchistan to have revealed such a long and continuous archaeological sequence. Its significance in the archaeology of the subcontinent as a whole lies in the discovery of the evidence of wheat–barley and cattle–sheep–goat domestication, the only combined evidence of its kind in the subcontinent. Although doubts have been expressed about it being an independent centre of wheat domestication, there is no doubt about this status *vis-à-vis* barley and cattle, sheep and goat.

The evidence of crop remains comes from their impressions in mud bricks and the charred remains of the plants themselves inside the impressions. Barley and wheat are the major crop types. The different varieties of barley are the naked and hulled barleys and the two-row and six-row barleys. In the case of the hulled type, the 'hull' or 'glume' holding the grain in the spikelet is difficult to separate even after the grain is ripe; the difference between the two-row and six-row types depends on the number of fertile florets on each spikelet. The important barley type in Period I at Mehrgarh is the naked six-row barley (*H. vulgare*, subspecies *vulgare* variant *nudum*). It is important in the sense that more than 90 per cent of the identified specimens belong to this type. These naked barley grains apparently supplied the straw necessary for the mud bricks of Period I. They had 'a short compact spike with shortened internodes and small rounded

seeds' and these characteristics have been interpreted in the context of Period I as those of 'cultivated but perhaps not completely domesticated plants'. These features are also said to be very marked among the barley grains of Periods II and III. Hulled six-row barley (*H. vulgare*, subspecies *vulgare*) occurs in a much lesser proportion, as do both wild (*H. vulgare*, subspecies *spontaneum*) and domestic (*H. vulgare,* subspecies *distichum*) hulled two-row barley. The fact that both wild and cultivated barley occur together in Period I marks out the site and this area as a part of the nuclear area of barley cultivation. This substantiates an earlier idea of R. Raikes who argued, on the basis of the rainfall distribution suitable for wild barley, that the distribution zone of wild barley could extend up to the Suleiman mountains in Baluchistan.

The number of chromosomes determines the species of wheat: 'diploid' with two sets of seven chromosomes, 'tetraploid' with four sets of seven chromosomes and 'hexaploid' with six sets of seven chromosomes. In Period I wheat does not seem to be a significant crop, although domesticated einkorn and emmer wheat (both 'hulled'; *Triticum monococcum* and *Triticum dicoccum*, respectively), and free-threshing or 'naked' *Triticum durum* are present in small proportions. Constantini notes that in the Mehrgarh archaeological column the tendency is towards the popularity of hexaploid wheat, *Triticum sphaerococcum*, in the later periods. The status of Mehrgarh Period I as being within the nuclear area of wheat cultivation is uncertain, there being no particular evidence of wild wheat type here, unless *Triticum durum* is considered a wild type. Indian *ber* (*Zizyphus jujube*) and dates (*Phoenix dactylifera*) are the only other identified plant products of Period I.

The process of domestication is more obvious in the case of animal remains. Wild sheep, goat, ass, deer (gazelle, blackbuck, 'sambar' and 'chital'), pig, water buffalo, cattle and possibly elephant dominate the assemblage in the earliest levels. There does not seem to be any doubt about the domestic status of at least some of the goats which are the most common animal type after gazelle in this level. Moreover, young goats were found placed in some of the burials of this period. Regarding sheep and cattle, their increasing occurrence and decreasing body size throughout the successive levels of Period I strongly support the hypothesis of their local domestication. The change in the size of sheep continued through Period II as well. Considering that the wild form of sheep (*Ovis orientalis*), from which modern domestic forms are said to be descended, occurs in the earliest levels of Mehrgarh and that diminution of sheep size continues through Periods I and II, there should not be any doubt about this area being a centre of sheep domestication.

The pre-ceramic occupational level of Mehrgarh, during this period as a whole was at two successive mounds, the later one overlying the southern slope of the earlier one which has been partly cut through by the Bolan, exposing a cliff section. Out of more than 32,000 microlithic, mostly blade-based artefacts (with the exception of a handful of ground 'neolithic' celts) from the site, about 20,000 or more belong to Period I, and their number decreases throughout the later periods. Microlithic tools and blades set into the groove of the sickle as a series of pointed teeth and glued with a thick layer of bitumen seem to be a distinctive feature of the site. The raw materials for the lithic industry came as chunks from the Bolan bed. The upper levels of Period I reveal an increasing number of multi-roomed units separated by open spaces meant both for domestic activities and burials. In the deepest levels one particular room measured 2 m by 1.8 m, with impressions of reed on the floor and a grinding stone. The walls were made of mud bricks of regular size (33 or 28 cm by 14.5 cm by 7 cm), which also carried finger impressions. Hearths were a common feature. There was a limited bone-tool industry comprising mostly awls. Stone vessels are rare, as are other stone objects, including perforated discs and spatulae with incised criss-cross designs.

Human burials occur throughout. In the deepest levels there are simple pit burials where bodies were put in a flexed position with five three-to-five-month old goats at their feet in at least two cases. Basket imprints in bitumen in the graves suggest both the use of such baskets and the arrangement of food for the dead in them. The bodies often bore personal ornaments: necklaces made of shell and calcite beads and dentalium shells, mother-of-pearl and shell pendants, belts made of steatite beads with bivalve shells, anklets made of calcite beads, bone rings, and more rarely, turquoise and lapis lazuli beads. Turquoise and lapis lazuli suggest that trade or exchange network extended presumably up to north-east Iran and Badakhshan in Afghanistan, whereas dentalium shells would suggest contacts with the coast, about 500 km away. In the upper levels designated as Period IB there is a regular graveyard of more than 220 sq m with 150 burials. These burials, mostly primary individual burials, are in each case associated with a low (only three courses in many cases) wall made of 'cigar-shape' mud bricks (length 15 to 50 cm, width and thickness 7 to 10 cm) which were handmade without moulds and bore a double row of finger tips on top. The examples of 'compacted corpses' meant the pushing of an already interred body or its remains to the other extremity of the grave to make room for a later second corpse. There are secondary burials too, where bones—sometimes of two or three individuals—were collected after an initial exposure of the body.

A narrow oblong pit (about 1–1.5 × 0.6–0.7 m) was first dug about 1 metre deep (for an adult). This provided access to a small funerary chamber dug as a lateral cavity at the bottom of the pit in strict conformity to the size of the flexed corpse (indeed, even narrower than a flexed corpse). After digging the grave, the corpse (or already dislocated human remains in the case of a secondary burial) was laid in the subterranean chamber which was not refilled but simply sealed by the construction of a special mud-brick wall (sometimes laid partly upon the corpse) high enough to close the lateral opening. During or after the building of the wall, the pit was filled with sediment. If the grave was re-opened after some time (for instance, to add another corpse), the access-pit was dug again and the wall dismantled so as to gain access to the still unfilled funerary chamber. After these mortuary acts (second deposit, corpse reduction, etc.), the funerary chamber was closed again by a new mud-brick wall and the pit filled up again.[2]

This, no doubt, is a radical change from the simple pit-burials of Period IA. What this means in terms of the society is diifficult to infer unless the study of the site is fully published. Nothing has yet been said about the distribution and character of grave goods in the burials with mud-brick walls. Finally, a significant item of Period I as a whole is a human figurine of unbaked clay with a rounded base and a conical body with a belt applied on it. Another feature is the occurrence of lumps of red ochre, occasionally even in graves. A bead, presumably made of copper, is said to occur in a child's burial in the upper levels, although this does not denote the beginning of copper-smelting and thus of true metallurgy. According to Jarrige, the end of Period I is unlikely to be much later than *c.* 6000 BC, and by and large Period II as a whole, inclusive of its phases A, B and C, is spread throughout the sixth and the first half of the fifth millennia BC. Pottery appears in IIA but is handmade and very limited. Compartmented buildings on hard clay foundations suggest systematic storage of grains, the seeds of barley (*Hordeum sphaerococcum*) having been found in some of the cells. Interestingly, this species of barley is said to grow only in irrigated fields, and thus the idea of a grain storage system in the excavated compartmented buildings of this period is acceptable. Some of these building spaces were also associated with the working areas for steatite objects and bone tools. A cylinder-shaped terracotta bead found outside one of these buildings, if rolled on clay, makes a cylinder-like vegetal design. A ring, a bead of copper and a small copper ingot appear in an early level of Period IIB, but otherwise the lithic and bone-tool kit of the earlier period continue to be in use. Two complete sickles with inset microlithic tools, an ivory tusk, lumps of red ochre and grinding stones have been found. Graves have been mentioned but the details seem to be missing. Cotton (*Gossypium sp.*) occurs in this period. Wheelmade pottery begins to appear along with handmade ones in Period IIC. The second half of the fifth

millennium BC is a rational enough date for Period III, and that takes off with tell-tale evidence of increasing craft-specialization and perhaps increasing social organizational complexity: fine micro-drills in stone indicating the use of bow-drills and the ability to engrave on shell; a few terracotta crucibles with traces of copper, which suggest for the first time local copper-smelting; large-scale production of wheelmade painted pottery showing inter-regional styles; and finally, 'an impressive complex of storage units' maintained in five compartmented buildings over three building phases. This is also the period when terracotta humped bulls first appear, although only as isolated examples. Perhaps more importantly, one now reads of 'specialized craftsmanship areas connected with the work of semi-precious stones or sea shells and with metallurgy, and a very extended pottery kiln area.'

A large and apparently densely occupied burial area in Period III, from where the remains of about 99 individuals have already been studied, clearly shows a change in the burial practices from those of Period IB. The walls made of 'cigar-shaped' mud-bricks in Period IB graves are completely missing now. In fact, it is not sure if the flexed bodies of this period were laid in the ground with any kind of mud-brick architecture. Interestingly, in case of about 25 per cent of the complete skeletons, the skulls are found resting on one mud-brick, called 'pillow-brick' by the excavators. With only one exception, the orientation of the body is east–west but occasionally it is turned towards the left, when the skull faces the south. An important additional feature is the discovery of a collective burial where some individuals have been put together. Only two pots, both wheelmade and painted, have been found placed in a grave (female no. 91), but pots do not figure among the grave-goods elsewhere in this period. Similarly, a circular compartmented stamp-seal of copper/bronze placed near the skull of female no. 33 is an isolated example. Personal ornaments—mostly steatite micro-beads fashioned into bracelets, necklaces and head-ornaments—are frequent among the grave-goods. In some cases there are pendants—worn either alone or with steatite micro-bead necklaces—of lapis lazuli, carnelian, turquoise, chrysoprase, agate, terracotta and perforated sea shells.

A detailed study of the skeletal biology of the large number of skeletons excavated at Mehrgarh has not been published yet, but J.R. Lukacs and his associates have published some analyses of their dental remains. There is low incidence of dental caries in the early levels of Mehrgarh, which may be due to the high fluoride content of the drinking water available in the area. This has been described as the discovery of dental fluorosis in the early skeletal series from Mehrgarh which, however, shows high incidence

of gross enamel hypoplasia and dental calculus. The tooth crown size in this series is megadont, i.e. large, which seems to indicate that 'the aceramic Neolithic occupants of Mehrgarh consumed a coarse diet that was suited for large dental structures.' There is also evidence of interproximal grooves in the dentition of the neolithic people of Mehrgarh, which may be due primarily to 'habitual tooth probing' to alleviate dental pain or may have something to do with the production of sinew and fibre. The dental health deteriorates in Period III when there is a general increase in the prevalence of dental disease such as increased dental caries, antemortem tooth loss and dental abscesses. This has been ascribed to a possible sophistication in the food preparation methods during this period.

Architecture seems to have become fairly substantial in Period IV. One reads of rooms interconnected by doors with wooden lintels and backed by wide (2.60 m wide) mud-brick walls. In one case the door was only 1.10 m high; people apparently had to bend before passing through it. The room they entered was 'covered up with grinding stones, pestles, one storage jar, one huge crushed basin with ridges and snake decorations inside, fine complete gob!ets, beautifully painted vessels, flakes, blades and many bones'. Pottery with inter-regional affinities continued to be made, some in polychrome style. A tubular female terracotta figurine with a pinched nose and joined legs defines a newly emerged form. Some changes in pottery styles and designs are noticed in Period V, but by and large things do not change, until Period VI. Interestingly, in the first half of Period VI, almost 50 per cent of the painted pottery is a red ware decorated with *pipal* leaves. Well-fired grey ware makes its appearance, and there is evidence of inter-regional pottery styles. A large kiln provides evidence of ceramic production for market. Terracotta female figurines with ornate hair styles, round and heavy breasts, and joined legs form a very distinct component of this period.

Periods VII and VIII of Mehrgarh do not concern us here. Period VII, despite the excavator's opinion to the contrary, may be contemporary with the Indus civilization in the plains. Jarrige suggests that Period VII of Mehrgarh antedates the foundation of an Indus civilization settlement at Nausharo close by. There is no reason why the foundation of an Indus civilization settlement at the entrance of the Bolan pass cannot be considerably later than the beginning of the civilization in the Indus plains.

### *The Quetta Valley: Kile Gul Mohammad and Damb Sadaat*[3]

From Mehrgarh the Quetta valley is easily accessed through the Bolan pass. The valley is in fact only on the other side of the pass and gives access to three other areas of Baluchistan: to Nushki and Chagai in the

south-west (and thus to Iranian and Afghan Seistan) through Shararud and Pishin Lora; to the Kalat area in the south-southwest through a series of valleys; and to the Zhob valley in the east. The valley has a north-south axis of about 65 km and is seldom more than 10 km wide. To its north is the Pishin area, about 55 km across and leading to the Chaman and Kandahar plains of south Afghanistan through the Khojak pass. Rainfall is less than 25 cm annually, but the valley is well populated because water for irrigation can be tapped by wells and an extensive *Karez* system which involves digging a horizontal underground passage into the water sources in the talus deposits at the sides of the valley and drawing this water out, as it comes along the passage, by a series of vertical shafts from above.

Archaeological excavations and surveys were conducted in the Quetta valley in 1949–51. The sequence has been built up on the basis of work at two sites, Kile Gul Mohammad (KGM) and Damb Sadaat (DS), Period IV or the uppermost occupation at Kile Gul Mohammad being contemporary with the earliest period or Period I of Damb Sadaat.

TABLE IV.2
Archaeological Sequence of the Quetta Valley
(after W.A. Fairservis, 1956)

| | |
|---|---|
| Period 1 (KGM I) | aceramic—wattle-and-daub and/or mud houses—cattle, sheep, goat, horse/wild ass—microliths and rare ground tools, bone points and spatula—the radiocarbon dates from the upper levels are in the first half of the fifth millennium BC (5000–4500 BC), and thus, the phase could have begun around 5500 BC or earlier. |
| Period 2 (KGM II) | new feature: crude handmade and basket-marked pottery. Weaving? |
| Period 3 (KGM III) | new feature: fine wheelmade black-on-red ware with simple geometric designs, fragment of an unidentified copper object. |
| Period 4 (KGM IV and DS I) | 'Kechi Beg Ware' (named after the site of Kechi Beg in this region where the pottery was first identified): well-fired and thin buff ware of deep open vases, bowls and jars with delicately painted motifs of dots and dashes, sigmas, hachures, etc. within horizontal bands—also ancillary use of red paint on this pottery to produce a polychrome effect. Mud-brick houses more common, occasionally on stone foundations. |

| | |
|---|---|
| Period 5 (DS II) | multi-roomed structures, with frequent use of limestone blocks in house foundations—fire-pits and modern *tandoor*-like ovens inside the houses—the development of 'Quetta Ware' or a black-on-buff ware, its typical forms being jars with flaring or straight rims, small-mouthed bowls with a sharp angle between shoulders and bases, and pedestalled jars—black painted designs in the areas between multiple rows of horizontal lines. Also, Faiz Mohammad Grey Ware: principally shallow plates and deep open bowls painted on their interior with a series of concentric lines surmounted by a single line of loops at the rim—the portion within these lines painted with a variety of geometric and naturalistic motifs. Female and cattle terracotta figurines—some of the cattle figures painted in black stripes and the female terracottas are of a type (the round-breasted, joint-legged type) found in Mehrgarh Period VI—house models in clay—clay compartmented stamp seals—clay rattles—copper/bronze dagger/knife blade—bone spatula-clay ladle—alabaster vessel—potter's marks. |
| Period 6 (DS III) | continuation of the earlier DS II features, but a large, apparently ceremonial structure built on a platform (at least 30 ft wide on one side) and associated with a drain made of limestone blocks—a human skull without the lower jaw found in a small stone-built hollow beneath the main wall—female terracottas of 'Zhob mother-goddess' type. |

Calibrated chronology of Damb Sadaat II seems to show a broad range with *c.* 3000 BC as the central point. It is also important to note that, according to Fairservis, the Indus civilization could be contemporary with the upper levels of DS II and DS III. On the basis of the evidence (fragments of thumb-nail incised pottery, perforated pottery, pipal leaf decoration on a grey sherd and bird figurines) he provides, it is clear that the Indus civilization in the plains is contemporary with at least the DS III level in the Quetta valley. He also notes that settlements in the Quetta valley seem to be very extensive in the DS II–DS III times: 'sites occur almost everywhere in the valley where fertile soil and water exist today, indicating that climatic conditions and the ecology of the modern Quetta valley are comparable to those of prehistoric times.'

### *The Zhob-Loralai Area: the Rana Ghundai Sequence*[4]

The Gomal river flows across the northernmost segment of north-east Baluchistan where it is joined by the Zhob river. The other drainage lines include the Anambar and the Thal rivers. Although explorations have not

been extensive, sites seem to be fairly evenly distributed in these river plains, beginning with Periano Ghundai in the Fort Sandeman area near the junction of the Zhob with the Gomal. A preliminary study here by Fairservis revealed the so-called 'Zhob-cult phase', marked by the occurrence of a particular type of goggle-eyed and hooded terracotta mother-goddess figurines known as Zhob mother-goddesses which are also found in Damb Sadaat III and Mehrgarh VI levels. According to Fairservis, this phase contained objects (perforated pottery, nail-incised bowls, etc.) typical of the Indus civilization. In the Anambar valley in the vicinity of Loralai there are three well known sites: Sur Jangal, Dabar Kot and Rana Ghundai. The first phase of Sur Jangal has been equated to Kile Gul Mohammad IV and its later phase to Damb Sadaat II–III. Small mud houses, model houses in terracotta and Zhob mother-goddess figurines and the overwhelming preponderance of cattle remains in the faunal assemblage form part of the general cultural scene. Painted pottery shows both humped and humpless cattle in great numbers. The suggestion is that in the Sur Jangal area situated in a typical Baluchi upland valley dominated by scrubby desert vegetation, cattle-herding and seasonal movements conditioned by the location of pastures could be the mainstay of the, economy. Dabar Kot and Rana Ghundai lie in a lesser elevation, 'ecologically transitional' between the Baluchi uplands and the Indus plains, and at Dabar Kot where the natural soil was not reached, the artefacts of the Indus civilization were noticed along with Zhob mother-goddess figurines in a trench high on the site. It is at Rana Ghundai that a representative occupational sequence of the area was traced by an enthusiastic army officer who was in charge of the troops in the Loralai and Zhob districts.

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TABLE IV.3

The Rana Ghundai Sequence (after Brigadier E.J. Ross, 1946)

Period 1 the 'pre-Bull period': almost exclusively handmade plain pottery—bones of domestic ox, sheep, goat, horse (opinion of an expert veterinary officer: the discovered horse teeth from this period 'practically indistinguishable either in structure and size from those of our modern cavalry horses') and ass (wild?)—microlithic chips and blades—bone points and eyed needles—ash deposits—occasional boulders and hard clay mass—'a semi-nomadic community'.

Period 2 apart from pottery, only microlithic chips and blades and some scattered animal bones—typical pottery: a wheelmade, fine, pale pinkish buff ware—mainly footed bowls with a wide shoulder—a painted frieze along the lower portion of the shoulder defined by multiple or double plain black bands—stylized representations of humped cattle—in one case black buck.

| | |
|---|---|
| Period 3 | new features but the basic pottery shape continued—introduction of red and possibly white in the painted designs, in addition to the original black—pinkish/buffish clay with plum-coloured slip—carafe-like vessels with not very controlled brushwork in the second level of this period, and in the third level tall narrow vessels become more common and mark a deterioration in the quality of painting. |
| Period 4 | complete disappearance of painted pottery—large open bowls of coarse grey material—microlithic artefacts? |
| Period 5 | no painted pottery—coarse embossed pottery. |

An important point made by Brigadier Ross is that irrigation must have been known from very early times: 'it seems very unlikely that this area could have supported the settled population indicated by the size and numbers of these sites unless irrigation was practised to an extent at least comparable to that of the present day'. The calibrated range of Rana Ghundai, period I is *c.* 4500–4300 BC, whereas the same for the first level of Period III is *c.* 3500–3100 BC.

### *The Kalat Plateau: Anjira and Sia Damb in the Sohrab Area*[5]

The Sohrab area lies south–south-west of Kalat, a principal point on the communication lines between north and south Baluchistan. The winter here is harsh enough to send people down to warmer areas. On the basis of her work at two sites, Anjira and Siah Damb, Beatrice de Cardi built up a composite sequence of occupation for the area.

TABLE IV.4

*The Sequence of the Kalat Plateau*

(after B. de Cardi 1965)

| | |
|---|---|
| Period 1 | a semi-nomadic settlement—red-slipped pottery and a flake-blade industry. |
| Period 2 | mud-brick buildings on boulder foundations—red-slipped, and burnished grey, wares—coarse vessels modelled in basketry frames. |
| Period 3 | roughly squared stone blocks as house foundations—the earlier pottery declines—appearance of 'Togau ware' (a black-on-red painted ware, with open bowls as a common shape; the bowls are painted with stylized ibexes, goats and birds on the inside just below the rim) and a bichrome ware—also, 'Zari ware' (painting in white with black outline) which is said to be a variant of Nal pottery—related to KGM IV–DSI phase of the Quetta valley |
| Period 4 | use of well-squared masonry—the occurrence of Nal pottery—related to DS II of the Quetta valley. |
| Period 5 | related to DS III of the Quetta valley. |

The beginning of the sequence seems to go back to KGM II of the Quetta valley.

### *The Khozdar Area: Nal*[6]

Khozdar also is an important communication point between north and south Baluchistan and there is a good deal of cultivation in the area with wild duck, geese, partridges, deer, and wild sheep and ibex in the vicinity. More importantly, between Khozdar and Nal, forming the apex point of a triangle linking these three places, is Sekran where there are extensive traces of old lead and antimony mining. Pre-industrial lead-smelting is also reported from the area. As a site Nal covered about 5 hectares and was excavated in 1925. The excavated area was designated Area A, where two kinds of structures, one utilizing the boulders of a local river bed and the other using large quarried stones from the neighbouring hills, were noticed. Otherwise, the whole area—all of its occupational depth of 1.2 m—was found full of burials which comprised mostly fractional burials in pots but had a few complete graves in defined graves as well. For example, an infant's grave was found in a small chamber made by setting mud-bricks on edge, and the grave goods included 16 beads (apparently a necklace) and a crystal pendant. A complete burial of an adult showed a grave where the body lay east–west, set on the left side, with the legs bent. There was no grave good here, just as there was no grave good in another infant burial. Complete burials without defined graves have also been recorded. The miscellaneous cultural material recovered from the deposit forms an impressive list: copper adze, saw, chisel, knife, seal with a holed lug on the reverse, silver foil, carbonate of lead, lead slag, a celt made of quartzite, limestone weights, balls, grinding stones, marble ring stone and disc, bone disc and worked fragments, cattle figurines, and a large number of beads made of crystal, agate, carnelian, paste and lapis lazuli. There was a piece of lollingite ore (ore of iron and arsenic: iron/Fe 49.3 per cent and arsenic/As 43.6 per cent) and a copper/Cu adze showed both lead/Pb and nickel/Ni alloying (Pb 2.14 per cent, Ni 4.90 per cent, Cu 93.5 per cent). The shape of Nal pottery is distinctive: narrow-mouthed, ovoid form with a disc-base; narrow-mouthed carinated form with a disc-base; almost straight-walled jars with a disc-base; disc-based open bowl; a carinated form with an inward-turning upper body; and a flat-bottomed canister with a round and straight-edged mouth. With the use of red, blue or yellow pigment, the painted surface is polychrome and shows repetition of motifs by multiplying their outlines in many cases. Naturalistic representations of fish and ibex occur as a motif.

There is no radiocarbon date from the site but Nal pottery has been

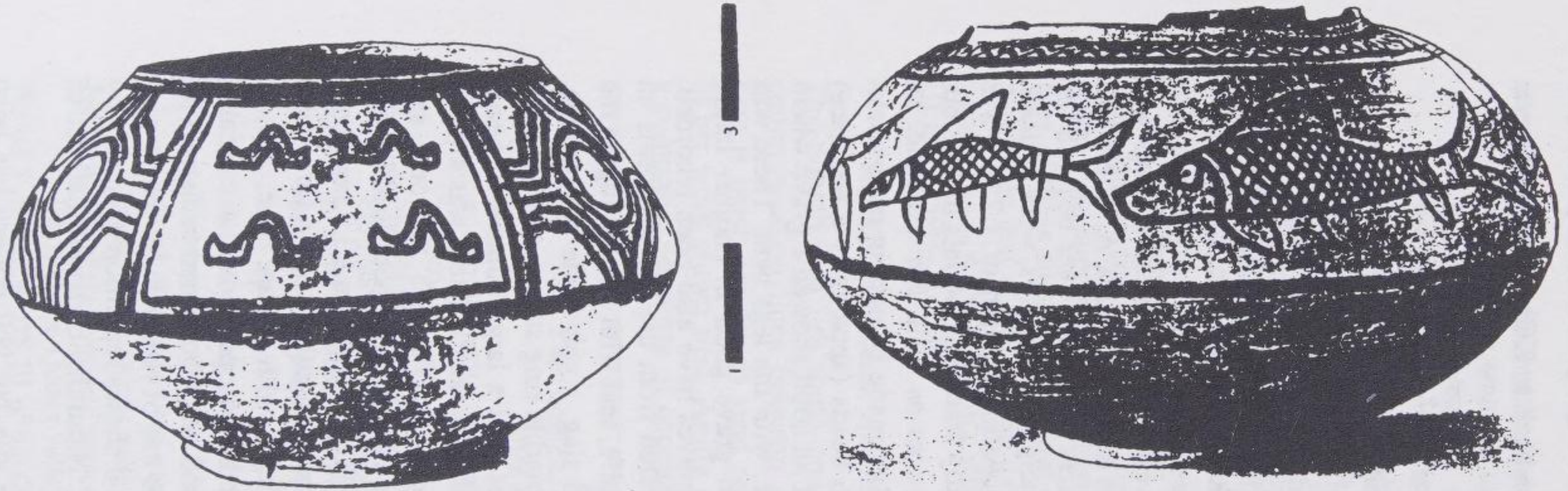


Fig. 13 Nal pottery (Hargreaves 1929)

bracketed in DS I and DS II in the Quetta valley and Period IV of the Anjira–Siah Damb sequence. According to Fairservis, the Nal settlements used an effective system of harnessing water. Two systems were employed, both separately and in conjunction with each other: soil was allowed to accumulate behind the steps of gabarbands laid across the slopes of the drainage, and a system of reservoir dams in which water was allowed to accumulate in a catch basin and slowly released to the fields, with dams being placed as weirs to divert water into canals leading to cultivated areas.

### *The Kulli Culture of Kolwa and the Area around Bela: Niai Buthi, Nindowari and Edith Shahr Complex*[7]

Bela lies in the Welpat tract which is watered by the Porali river. It is an attractive area both for its rich agriculture and its position on the route from the coast and/or south Baluchistan to Kalat. The Kolwa tract lies to the north-west of Bela and was known for its large quantities of grain, which were exported to its neighbouring areas. The main site of Kolwa is Kulli which has given its name to a culture with a distinct pottery type associated with it. A second major site of this culture is Mehi which is in the Mushki valley to the north-west of Kolwa. Only the upper levels were exposed both at Kulli and Mehi. Kulli, a 12 ha site, showed multi-roomed stone structures, the blocks of their shale stone being brought from about 3 km away. There were two massive stone querns and their rubbing stones, beads of black stone, lapis lazuli, agate and carnelian, curved bone (?) bangles and small amounts of copper, gold and glass (?). Pottery is elaborately decorated and diverse in shapes and colour, but a characteristic feature is the presence of elongated animal forms with large and round eyes, shown in framed landscapes. Among other things, Mehi (10 ha) has yielded evidence of cremation and the subsequent burial of ashes, bones, etc. (in one case, in a pot, and in another, covered by earth). At Niai Buthi, there are two phases of the Kulli culture, the upper phase being dated by radiocarbon in the late third millennium BC. At Nindowari (45 ha), there is a central, stepped structural complex, its stone-blocks weighing up to one ton. Associated with this is an assemblage of typical Kulli pottery, terra-cotta mother-goddess figurines with applique decorations, painted bull figurines and two Indus civilization seals. The calibrated date is *c.* mid-third millennium BC. Edith Shahr (29 ha) shows a matrix of large river boulders set in mud and smaller stones. There is a series of stepped plat-forms and typical Kulli pottery and mother-goddess figurines. Edith Shahr has been associated with the upper phase of Niai Buthi. It may be noted that Las Bela has a known source of copper and it will not be surprising if

Fig. 14 Kulli pottery from Nindowari (Casal 1966)

the sites mentioned here are reflective of the wealth generated by mining and metallurgy.

### *The Coastal Plain of Sonmiani Bay: Bala Kot*[8]

Bala Kot (2.8 ha) is in the Khurkera alluvial plain at the mouth of the Windar river falling into the Sonmiani Bay. Of the two periods of the site, the upper one belongs to the Indus civilization whereas the lower one or Period I constitutes a separate culture called Balakotian. In this earlier period we find mud-brick houses (mud-brick size $10 \times 20 \times 40$ cm or the ratio of 1:2:4) whose orientation is different from that of the Period II houses. Wheelmade painted pottery, some related to Nal polychrome style, right from the beginning of occupation, has been found. Humped bull figurines, microlithic tools, beads of lapis lazuli, stone, shell and paste, a limited amount of copper and miscellaneous terracotta, shell and bone objects complete the other cultural details. Cattle, sheep, goat, buffalo, pig, hare and deer of several varieties have been identified but not much use was made of the available marine sources of food. The grains include six-row barley, vetch, legume and *ber* (*zyziphus*). The calibrated date-bracket is between the late fifth millennium (*c.* 4200 BC) and early third millennium BC.

### *The Turbat Oasis in the Kej Valley: Miri Qalat and Shahi Tump*[9]

The Turbat oasis, far to the west of the Las Bela plain and towards Irani Baluchistan, has been favourably commented on by Aurel Stein:

> a narrow strip of fertile irrigated land, comprising a practically unbroken string of villages mostly small, stretches on both banks of the Kej river for a total distance of about seven miles. . . . This oasis appears to have since early times formed an important, if not the chief, centre of population in Makran. . . . The oasis . . . owes this importance not merely to its economic resources being greater than those of any other tract in Makran but perhaps equally also to its convenient central position on the great natural highway which the Kej valley provides through the country.

Irrigation is practised here through the karez system and canals from the river. Date palm is noted to be the principal crop of the area.

The site of Miri was noticed by Stein but has been reinvestigated in recent years by R. Besenval. Of its four periods, the fourth one from below is Harappan or belongs to the Indus civilization.

TABLE IV.5

*The Sequence in the Turbat Oasis*

(after Besenval, 1994)

| | |
|---|---|
| Period 1: | levels 5 and 6—a large wall of stones and microlithic tools in level 5—a grave covered with flat river stones in level 6—end fifth millennium BC date for level 5—level 6 or the beginning of occupation at the site is thus earlier—no pottery reported from this period. |
| Period 2: | 'Miri culture'—mud-brick houses on stone bases—orange-red to grey pottery with geometric designs in brown-black—the firing process used for grey ware involved the piling of small vessels inside stacked large globular jars—also, flat terracotta bangles with a mat-print on the internal face, terracotta sling-ball, shell bangles, terracotta lamps, steatite and other stone vessels—first half of the fourth millennium BC. |
| Period 3A: | 2nd half of the fourth to the beginning of the third millennium BC—not clearly defined, but the presence of Nal polychrome pottery—earlier pottery types apparently continued. |
| Period 3B: | first half/middle of the third millennium BC—continuation of earlier pottery types (both painted orange-red and grey). |

Shahi Tump is in the same area. The interesting features of this site are a distinct grey and richly painted (in black) pottery, associated with apparently extended burials. A common shape is an open flat-bottomed bowl. In addition to the pottery, the grave goods comprised a copper spear-head, a copper flat axe, a large number of stone beads, microlithic blades,

etc. A large number of terracotta figurines of humped bull is another distinctive feature. According to Besenval, the elements of Shahi Tump burial assemblage appear in Period II of Miri and the assemblage as a whole may be equated to Miri IIIA and partly to Miri IIIB.

### *Early Village Cultures of Baluchistan*

These prehistoric village sites of Baluchistan are concentrated only in those areas which are still agriculturally viable and lie on arterial routes of the region: the north of the Kachhi plain at the mouth of the Bolan pass, the Quetta valley on the other side of this pass (a major communication point of that part), the Khozdar area in the Kalat plateau (communication point between north and south Baluchistan, agriculturally viable and near a rich source of lead), the Kolwa area (agriculture), the Bela area (agriculture and copper source), the coastal plain of the Sonmiani Bay (alluvial agriculture, also a commmunication point), and the Turbat oasis (agriculture and communication point). Another prosperous area of Baluchistan—the Panjgur oasis to the north-east of the Turbat oasis—has been left out here for lack of stratified excavations. However, Stein reported traces of prehistoric villages there, and one of his sites, Sari Damb, seems to have been put in the very beginning of occupations in this area. Thus, it is unlikely that Baluchistan has had a major climatic change since the period of prehistoric village occupations. Second, the basic archaeological sequence in all these areas is virtually uninterrupted. Tracing the beginning of cattle, sheep, goat and at least barley (if not wheat) cultivation at Mehrgarh, we witness the steady and continuous development of village life at this site. Once agriculture begins in other areas, one witnesses the same process. Third, this continuity of sequence notwithstanding, there must have been a fair amount of contact between all the component areas of not merely Baluchistan but also of the wider Oxus-Indus interaction zone of which Baluchistan is a part. Detailed comparisons between artefacts, especially pottery, found in the archaeological columns of different component areas is out of place here, but the parallels in the pottery styles of the Quetta valley and southern Turkmenistan are well known, and so are the parallels between the Rana Ghundai II pottery and the pottery of Hissar and Sialk in Iran. The story of the growth of wheat-barley-cattle-sheep-goat agriculture in Baluchistan, although independent to a large extent, is in a sense part of the agricultural growth in the Indo-Iranian borderlands as a whole.

## THE MOUNTAINOUS RIM IN THE NORTH-WEST: BANNU[10]

The 70 km × 80 km sedimentary basin of Bannu is surrounded by hills on

all sides, with the high mountains on the Afghan border on the west and north-west. The Kurram and Tochi rivers provide the perennial drainage and some major communication lines with Afghanistan, and although vegetation at present is highly degraded, what has been suggested for Baluchistan may also be suggested for Bannu: there is no clear evidence of climatic change over the past few millennia. Irrigation is practised along the river courses but dry-farming areas depend more on pastoralism than on agriculture. Of all the sites excavated in the region, Sheri Khan Tarakai, located on the bank of a non-perennial stream of the Tochi system, is the most important, both because of its antiquity and the clearly documented details of cultural remains. The calibrated date range is *c.* 4500–*c.* 3000 BC. Mud-brick houses on stone/boulder foundations were common, along with an impressive set of saddle querns and mullers, ring-stones, ground celts, microlithic industry, bone tools, occasionally painted terracotta bull and female figurines, terracotta spindle-whorls, cultivation of barley, use of sheep, goat, cattle and buffalo, freshwater gastropods suggesting a greater reliability of water source in the past, chank shells of the Indian Ocean variety (*Turbinella pyrum*), and two major categories of painted pottery. One of these is a coarse handmade type with thick black-slipped exterior and a burnished pinkish buff to cream-slipped interior with black or brownish painted designs which include standing caprids. The external surface of the second type is roughened with the application of a thick slurry of clay, although the neck and the shoulder may be unroughened and decorated. Interestingly, metal is absent in this level which is thus considered 'neolithic'.

The third millennium BC levels in Bannu are associated with the Kot Diji culture of the plains and have been excavated at Tarakai Qila, Lewan, Islam Chowki and Lake Largai, all in the Tochi-Baran interfluve. At Tarakai Qila, mud-brick architecture with massive walls in places has been found along with wheat, barley, lentil and field-pea, whereas at Lewan there is only a series of excavated pits without any clear architectural association. Otherwise, however, Lewan gives the impression of being a production site of stone objects like querns, mullers, ground stone artefacts, etc. Islam Chowki is interesting for the evidence of a damaging flood during its prehistoric occupation which has among other things sheep, goat, cattle, horse/ass, wheat and barley. Lake Largai had, in addition, bones of rhinoceros. On the whole, the Bannu basin offers ~~an uninter-~~ rupted sequence of village occupations right from the middle of the fifth millennium BC.

## The Western Fringe of the Indus-Hakra Alluvium: The Gomal Valley[11]

Like the Kachhi plain, the Gomal valley juts out of the Indus alluvium towards north-east Baluchistan and Afghanistan. The archaeological sequence begins in the Period I of Gumla, a small site of a little more than one acre, and ends up with the Indus civilization. Period I is aceramic and shows microliths, domesticated cattle bone, and large shallow pits used for cooking/roasting. Period II has a wide range of painted wheelmade pottery (some with 'Quetta ware' designs and some with 'Kot Diji forms'), microlithic tools, a limited amount of copper and bronze and terracotta bangles, gamesmen, toycarts and cattle and female figurines (one type with a stylized lower body and the other in a seated posture but with extended-out bent legs). Period III is dominated by Kot Diji pottery forms and designs (cf. 'horned deity') and the appearance of a new terracotta female figurine style (flat triangular lower portion extended out in front), but otherwise there is continuity of occupation. Period IV belongs to the Indus civilization.

Rehman Dheri is a much larger site (more than 20 ha) in an area which receives less than 164 cm of annual rainfall. Here, the *barani dagar* method of irrigation, in which the water is allowed to accumulate in the fields by banking the lower sides, and when they are dry ploughing and sowing are done, taking care to level the field with a wooden plank to seal its capillary line and thus keep the moisture inside, is practised. Although periodization has been offered on the basis of the changes in pottery designs and styles, basically it is a Kot Diji culture site, showing an increasing number of Kot Diji pottery forms and designs culminating in some Indus civilization examples. Otherwise, the site is fortified right from the beginning, with a 1.2 m wide mud and mud-brick wall resting on a 1.8 m wide foundation wall of the same material. Wheat, barley, fish and domesticated cattle, sheep and goat complement the picture, but two interesting features of the site are the occurrence of an ivory seal (two stags on one side, a scorpion and a frog on the other) right at the beginning and the wide occurrence of graffiti engraved either on the bases or at the rims of pots from the middle phase onwards. The calibrated date range of Rehman Dheri is *c.* 3400–2100 BC.

## The Western Fringe of the Indus-Hakra Alluvium: Kirthar Piedmont and Kohistan[12]

It is a distinct geographical area, with the Kirthar rampart paralleled on the

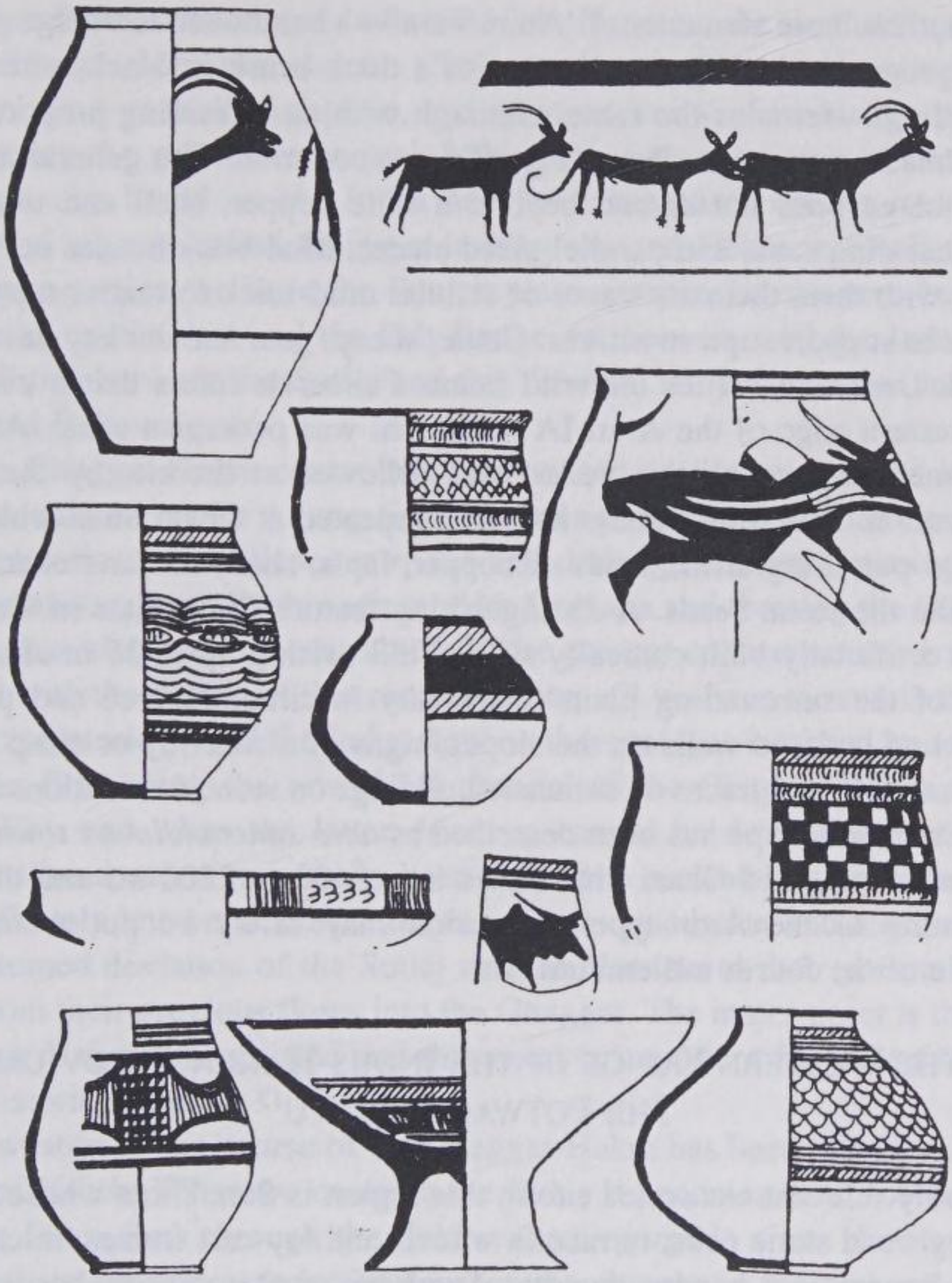


Fig. 15 Amri Pottery (Asthana 1985)

east by the Lakhi range and outliers and bordered on the east and south-east by Kohistan where low, parallel ridges define wide open valleys with thermal springs and rivers. One of the well-known sites of this geographical sector, Amri, is located at the edge of the cultivated alluvium within 2 km of the right bank of the Indus, but most of the related sites are located around thermal springs and take advantage of the water coming down the innumerable minor water-courses of the region. Good agricultural soi are, however, said to be limited, but large grazing areas and plentiful year-round supply of water make it suitable for large-scale pastoralism as well. Period I at Amri is divided into four phases on the basis of ceramic chan-

ges, but the basic character of 'Amri ware'—a handmade red/beige pottery with geometrical designs painted with a thick brush in black, often with red fillings—remains the same, although with an increasing proportion of wheelmade specimens. Potter's graffiti are common. The general artefact assemblage does not extend beyond a little copper, shell and terracotta bangles, sling stone and parallel-sided blades. Mud-brick houses occur, but along with them there are traces of cellular mud-brick formations, possibly meant to support superstructures. Cattle, sheep, goat and donkey have been found. Deer account for the wild fauna. Fairservis infers that a trench at the western edge of the Amri IA settlement was perhaps a canal. After an 'intermediate' period, this period was followed at the site by the Indus civilization. The Amri pattern has been repeated at Ghazi Shah which has yielded potter's graffiti, beads of copper, lapis, shell, etc. and chert drills to make the stone beads. A distinguishing feature of the sites in Kohistan is 'an artificially built conically shaped hill', rising up to 25 m above the level of the surrounding plain. They vary in circumference and possess encircling terraced walls on the slopes, signs of a stairway or ramp on the southern side and traces of domestic buildings on stone foundations below. This settlement type has been described as *acro-sanctum/lower towns*. The calibrated range of Ghazi Shah dates is *c.* 3400–*c.* 2800 BC and thus the beginning of the Amri-type occupation may safely be put around the middle of the fourth millennium BC.

## The Western Fringe of the Indus-Hakra Alluvium: The Potwar Plateau[13]

The only relevant excavated site in this region is Saraikhola whose Period I has ground stone celts, terracotta wheels and toy-cart frames, microlithic tools, bone points, handmade pottery with basketry-impressed base, and no metal. The transition to Period II was gradual, handmade pottery being replaced with wheelmade type. An example of this kind was a red jar with a short neck and a large elliptical/ovoid body, and painted black at the neck and shoulder. This is a typical 'Kot Diji' form, more of which has been found in this period, along with some copper, terracotta and shell bangles, microlithic and ground stone artefacts, terracotta cattle figurines, toy-cart frames, sling pellets, stone beads, etc. There is no radiocarbon date but Period II should belong to the second half of the third millennium BC.

## The Indus-Hakra Plain[14]

Since the Ganga-Yamuna Doab does not begin till Delhi, we have here for

consideration Pakistani and Indian Punjab, Haryana, the part of Rajasthan which borders Haryana, and the Cholistan desert of Bahawalpur in Pakistan. This is a vast alluvial plain, and what we know of its history tells us that during the protohistoric period this plain was the home of two river systems: one based on the Indus and the other based on the now-dried course of what is called Ghaggar in Haryana and Hakra in Cholistan. In the upper portion we have the Punjab plains proper, i.e. the area between the Sutlej on the east and the Salt Range on the west, and the Indo-Gangetic divide between the Sutlej and the Yamuna. Its lower section includes Sind and Bahawalpur.

The Ghaggar-Hakra course has been traced on the ground and its history speculated on for a long time beginning with C.F. Oldham in 1874. The network of miscellaneous rivers and drainage channels coming from the Himalayan foothills through modern Haryana and forming the Ghaggar system has also been reconstructed. In the present context we are not concerned with the details of this reconstruction; all we have to note is that till the protohistoric period the Indus flow on the west was matched by a parallel river-flow along the now-dried channel of the Ghaggar-Hakra on the east. Why and when the latter dried up cannot be determined; at some point its headwaters must have been subject to serious loss of water. It is not definitely known whether this was due to denudation and erosion or to the assumed deviation of the Sutlej and the Yamuna to their present channels from their previous flows into the Ghaggar. The major point is that the Ghaggar-Hakra flow existed and this point is important for understanding protohistoric India.

Downstream, the course of the Ghaggar-Hakra has been traced up to the Rann of Kutch. When we come to the Indus it becomes clear too that the present Indus flow through the Sukkur-Rorhi gorge is a late development and that its upper course in Sind was perhaps more to the east and eventually joined the Ghaggar-Hakra course before flowing as a combined river into the Rann of Kutch. Thus, the protohistoric picture of this part of the subcontinent is that of two majestic rivers flowing along the two edges of a vast alluvial plain and possibly joining together before forming a single delta at the mouth of the present Rann of Kutch.

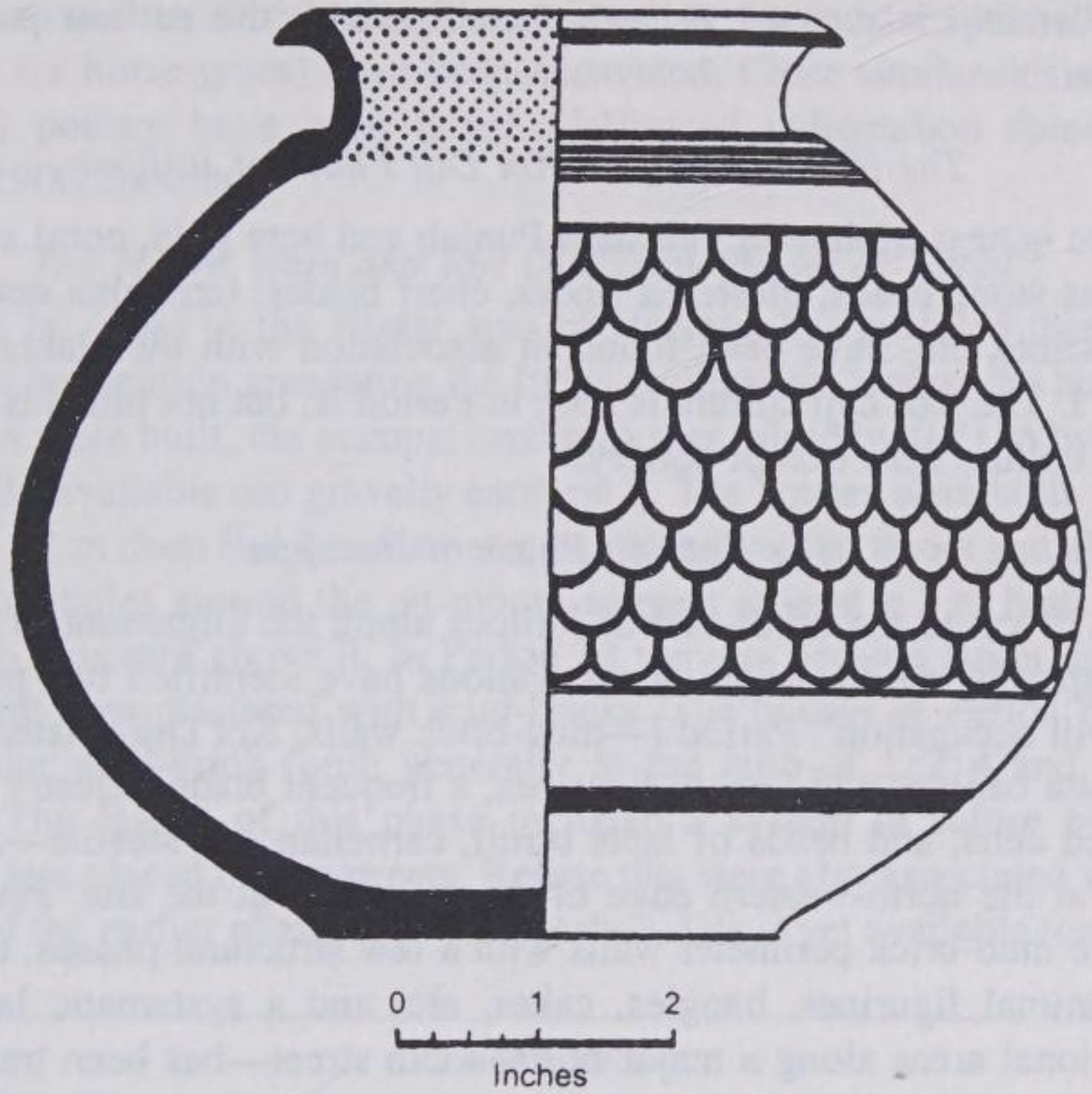
### *The Hakra Ware Sites in Cholistan*[14]

All that can be pointed out in this sector is the density of site distribution and the inferences drawn from the surface observation of these sites. The site survey in Cholistan undertaken by R. Mughal is among the most significant surveys in subcontinental archaeology. The Hakra ware (thus named because Hakra ware, a thick and underfired handmade pottery

whose main form is a globular jar with a thick application of a slightly liquid mud paste mixed with broken bits of sherds, was first found located in this Hakra area) sites are 99 in number with the following size hierarchy: from 0.1 to 5 ha in size—21 sites; 5.1 to 10 ha—5 sites; 10.1 to 20 ha—7 sites; 20.1 to 30 ha—4 sites. A grading of the relative importance of these sites is clear and suggests a long background of adaptation to this area, of which we know nothing at present. A distinction has also been made between camp sites (52), settlement sites (45) and industrial sites with kilns (2). The sites are located mostly on mud-flats but some are on top of the fossilized sand dunes as well. Further, they stand out as distinct sites, with only six of them being occupied in later periods (two in the Kot Diji phase and four in the Indus civilization phase). The non-pottery finds include terracotta cattle figurines, terracotta and shell bangles, grinding stones, bits of copper and a microlithic industry. At present, the Hakra ware sites mark the first defined phase of village occupation in the Indus-Hakra plain. We have noted that the jar-type pottery with a slurry of mud applied to its body, which is typical of the Hakra ware complex, occurs at Sheri Khan Tarakai in Bannu and on this basis the beginning of the Hakra ware phase may be put, according to Mughal, at the very beginning of the fourth millennium BC. Mughal's more recent explorations have also added some Hakra ware sites in Pakistani Punjab beyond Cholistan, extending up to the Faisalabad area in the central section of the Ravi-Chenab doab.

### *The Kot Diji Sites in Cholistan and Kot Diji in Sind*

The densest distribution of the Kot Diji phase sites is not in Sind, where this phase was identified as marking the immediately antecedent level of the Indus civilization at the site of Kot Diji in the 1950s, but in Cholistan. Here 40-odd sites share a slightly different but overlapping area of distribution with the sites of the Hakra ware phase. A four-tiered site hierarchy is clear: 0.1 to 5 ha—19 sites; 5.1 to 10 ha—8 sites; 10.1 to 20 ha—3 sites; 20.1 to 30 ha—2 sites. Kilns are found at 14 sites. At Kot Diji, the Indus civilization levels overlie the Kot Diji culture levels after a deposit with traces of burning. The Kot Diji culture settlement comprised a fortified (mud wall on stone-block-built supporting wall, with bastions and revetments of mud-brick in places on the outside) 'citadel' complex and a habitation area at the lower levels of the site. Terracotta toys, plain and painted bangles, cakes, cones, beads, cattle figurines, miscellaneous objects of shell and bone and a microlithic industry occur alongside a rich pottery assemblage. A short-necked ovoid jar which is painted at the neck is considered almost a type-fossil, and among designs one notices 'horned deities', pipal leaves and fish-scales. The earliest calibrated point of dates



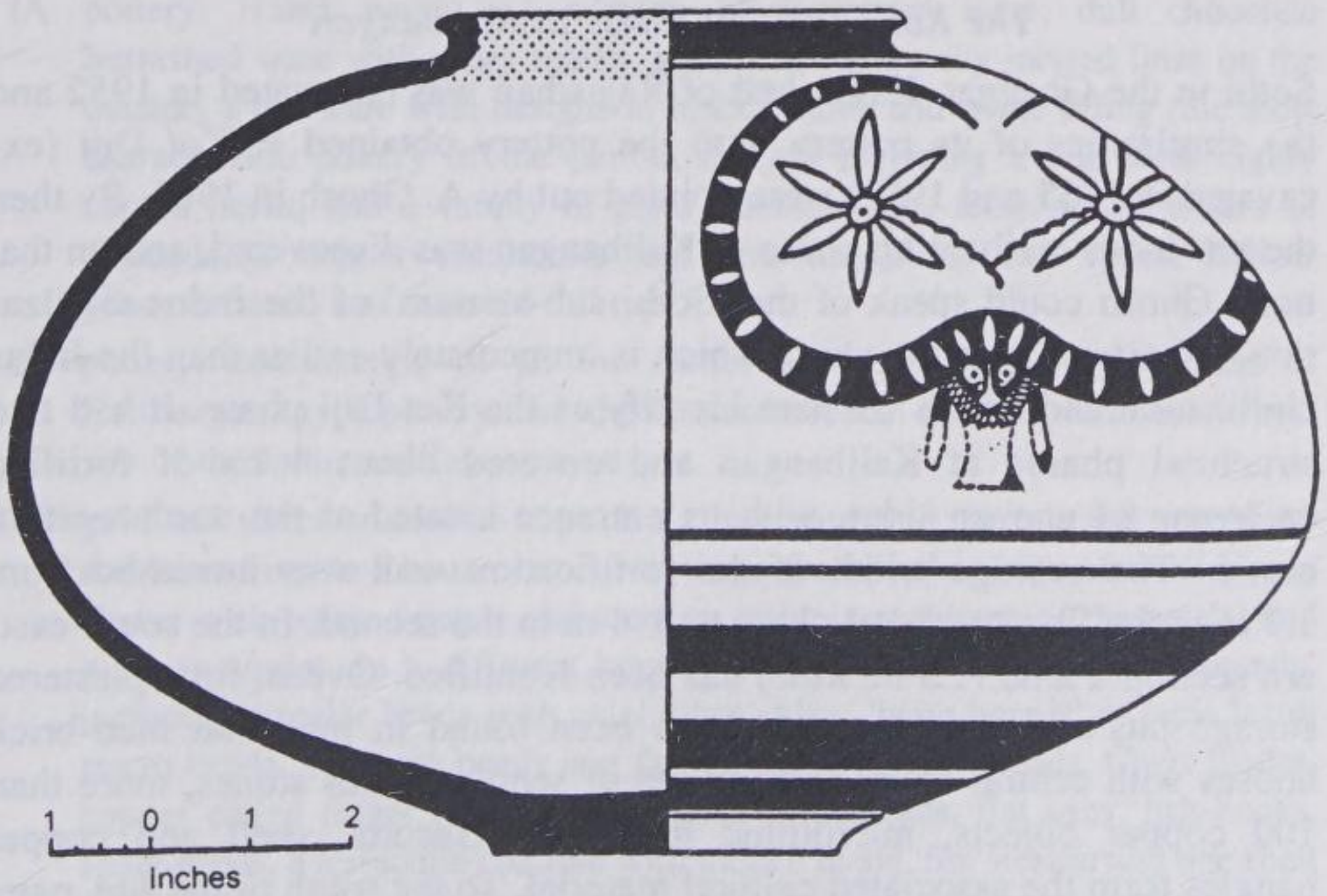




Fig. 16 Kot Diji pottery (Khan 1965)

from Kot Diji is *c.* 3300 BC, which tallies with the earliest point from Harappa.

### *The Hakra Ware and Kot Diji Phase at Jalilpur*

The site is near Multan in Pakistani Punjab and here gold, coral and semi-precious stone beads, plastered floors, chert blades, terracotta net-sinkers, bone points, etc. have been found in association with the Hakra ware in Period I. The Kot Diji culture is seen in Period II, but not much is reported of this culture here except pottery.

### *The Kot Diji Phase at Harappa*[15]

About 70 km to the north-east of Jalilpur along the alignment of the Ravi is Harappa where the ongoing excavations have identified two periods of 'Kot Diji occupation'. Period I—mud-brick walls, Kot Diji-related pottery, terracotta bangles and female figurines, a frequent blade industry and rare polished celts, and beads of lapis lazuli, carnelian and steatite—has been traced at the north-western edge of the mound E at the site. Period II—massive mud-brick perimeter walls with a few structural phases, terracotta toys, animal figurines, bangles, cakes, etc. and a systematic lay-out of habitational areas along a major north–south street—has been traced both in this section and along the southern edge of the mound. The Period II settlement covered more than 13 ha.

### *The Kot Diji/Sothi Phase at Kalibangan*[16]

Sothi in the Ghaggar–Hakra belt of Rajasthan was excavated in 1952 and the similarities of its pottery with the pottery obtained at Kot Diji (excavated in 1955 and 1957) were pointed out by A. Ghosh in 1964. By then the pre-Indus civilization phase of Kalibangan was discovered, and on that basis Ghosh could speak of the 'Sothi sub-stratum' of the Indus civilization. Otherwise, it is the phase which is immediately earlier than the Indus civilization and which we here identify as the Kot Diji phase. It had two structural phases at Kalibangan and covered about 4 ha of fortified enclosure of uneven sides, with its entrance located at the north-western corner. The average width of the fortification wall was increased from 1.9 m in the first structural phase to 3–4 m in the second. In the south-eastern section a lane (1.5 m wide) has been identified. Ovens, lime-plastered storage pits and saddle querns have been found in mud and mud-brick houses with central courtyards. Beads of semi-precious stones, more than 100 copper objects, microlithic industry, terracotta, shell and copper bangles form the associated cultural material. To the south of the site, parts of a cultivated field (the north–south furrow marks spaced at 1.9 m and the

east–west ones at 30 cm, the former possibly for mustard and the latter possibly for horse-gram) have been excavated. Close similarities with the Kot Diji pottery have been noted. Calibrated radiocarbon dates begin around 2900/2800 BC.

### *The Hakra Ware and Kot Diji/Sothi Phases at Kunal*[17]

This site (*c.* 1 ha) in the Hissar area of Haryana has revealed three main phases of occupation antedating the Indus civilization. Before the houses of Period IA were built, the occupational area was raised by 0.71 m by dumping locally available red gravelly earth on it. The houses were built, first by creating 1.1 m deep and 2 m diameter pits with rammed floors and plastered sides. Post-holes around the pit-mouth suggest at least a 2 m high wattle-and-daub structure above it. In Period IB the pits became larger and their sides were now plastered with mud-bricks. The houses of Period IC were rectangular mud-brick (built generally in the ratio of 1:2:4 and 1:2:3) houses. The layout of this phase included a system of refuse bins and soakage jars placed on the streets. Refuse pits were also associated with the houses of the earlier phases. No radiocarbon date is yet available for Kunal.

TABLE IV.6

*The Phase-wise Non-structural Cultural Details of Kunal*

(after Khatri and Acharya, 1994–95)

IA: pottery: Hakra ware, a handmade black-and-red ware, dull chocolate burnished ware with wavy marks, a dull red with wavy incised lines on the outside, a red ware with designs in black outline and white filling (the most characteristic pottery of the period; designs including a bull with highly curved horns, and a variety of pipal leaves)—bone tools, micro blades of chalcedony, copper fish-hooks and arrowheads (of two types: hollow concave-based and inverted 'V' type).

IB: pottery: continuation of all the earlier types, but also, a profusion of Kalibangan I type pottery and 'the first occurrence' of sturdy red beakers and jars of the Indus civilization type.

IC: gold and silver ornaments kept on a silver sheet and put in a red pottery jar and buried inside a house: two silver tiaras (both in the shape of a full-blown flower with pointed petals and a crown insignia at the top of the petals) and a silver armlet. In a different house: 'a large number of gold ornaments' including circular beads with axial tubes. Also, 'large hoards' of lapis lazuli micro-beads, 92 agate beads and faience and carnelian beads. Chert blades, copper coiled finger rings, coiled cones, arrowheads, flat axes, fish-hooks, spear-heads, a terracotta crucible with molten metal. Six steatite and one shell seals with geometric designs.

### *The Kot Diji/Sothi Phase at Banawali and Other Places in Indian Punjab and Haryana*[18]

The detailed planning of this phase at this site, also near Hissar in Haryana, is not understood, but mud-brick houses (some low and squat with thatched roofs) contain hearths inside and plastered storage pits in the courtyard. The pottery is Kalibangan I type and a sherd shows the black painting of a canopied cart with spoked wheels. In addition to the presence of copper, lithic blade industry, terracotta objects, gold and semi-precious stone beads, etc. there is a cubical chert weight of 87.55 gm, supposedly 100 times of the Indus civilization weight unit of 0.857 gm. There is no radiocarbon date from this period at Banawali. Further, along the Ghaggar-Hakra drainage, the evidence of this phase has been excavated at places like Siswal and Balu in Haryana and Rohira and Mahorana in Indian Punjab. The assemblage is generally identical with the Kalibangan I assemblage, although date-wise some of these places may be later.

## THE ARAVALLI BELT: THE GROWTH OF AN EARLY METALLURGICAL CENTRE[19]

Apart from the desert, the Aravallis provide the natural eastern boundary of the Indus-Hakra plain. All along its north-east–south-east alignment in Rajasthan there is a distinct image of a metallurgical growth which seems to go back well into the fourth millennium BC. We begin with Phase II of the mesolithic occupation at Bagor near Bhilwara, which has yielded three arrowheads (with holes for hafting), one thin rod and one broken spearhead. The calibrated date range is 3501–3100 BC. To understand this occurrence we have to turn to the excavations at Ganeshwar and the distribution of related sites and metal deposits in north-eastern Rajasthan and adjacent Haryana.

TABLE IV.7

*The Ganeshwar Sequence*

(after P.L. Chakravarty and Vijay Kumar 1987–88)

| | |
|---|---|
| Phase 1: | microlithic industry associated with presumably wild fauna. |
| Phase 2: | microliths and animal bones continued, but also, copper objects (5 arrowheads, 3 fish-hooks, 1 spearhead, 1 awl)—both handmade and wheelmade but unpainted pottery—circular huts and stone-paved floors. |
| Phase 3: | microliths and animal bones—several hundred copper objects (arrow-heads, rings, bangles, spearheads, chisels, balls, axes, etc.)—a wide range of pottery, said to be of pre-Indus civilization affinity. |

When Ganeshwar was discovered and excavated by R.C. Agrawala in the late 1970s, he also found ochre-coloured incised ware of a type which was found by him at Jodhpura in the same general area in a late fourth–early third millennia BC (calibrated) context. Ganeshwar has later contexts too, but at this point we should take due note of its early phases. The Bagor II arrowheads are of the Ganeshwar type as are a few arrowheads from Kunal IA. More than 80 Ganeshwar culture sites are known principally from the Sikar district and partly from Jaipur and Churu districts of Rajasthan. The Aravallis in this part of Rajasthan and their extensions or outliers in Haryana (cf. Narnaul and Tosam areas) constitute a major copper and tin-bearing area (tin in Tosam). However, the full implications of the development and ramifications of metallurgy in this region will have to await fuller research.

## GUJARAT[20]

The most important evidence of the pre-Indus civilization sequence in Gujarat has emerged principally at Dholavira located on an island of the present shallow Rann of Kutch. As the combined course of the Indus and Ghaggar-Hakra used to flow into this Rann in protohistory, the present area of Dholavira could be an island surrounded by deeper water or this could be a part of the delta system built by this combined flow. The point is uncertain.

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TABLE IV.8

*The pre-Indus Civilization Sequence at Dholavira*

(after Bisht 1996)

Stage I: fortification (southern arm properly traced—11.1 m basal width, extant height 4 m, originally higher-rubble stones set in mud mortar)—the use of mud-bricks in the ratio of 1:2:4—copper metallurgy–stone-dressing–lithic blade industry—shell-working–terracotta cakes, bangles–stone beads–perforated jars and dish-on-stands among pottery types.

Stage II: addition of 2.8 m thick mud-brick wall built against the inner face of the earlier fortification—expansion of settlement.

Stage III: A, B and C—right from the beginning 'diagnostic Indus civilization elements present'.

Stage IV: marks the classical Indus civilization stage at Dholavira. But it is Stage III which marked the period of transition to this civilization at the site. The fortification wall around the settlement of the earlier two stages was widened on the inner side by *c.* 4.5 m. The existing walled settlement was converted into a distinct complex showing two separate but adjoined fortified areas: the higher 'castle' on the east and the

lower 'bailey' on the west. The buildings of Stage II, which lay to the north of the 'castle–bailey' complex, were cleared and an open space—perhaps a ceremonial ground—created in that place. Further north, the 'middle town' with its own fortification walls was laid out. Finally, the outer fortification wall of Dholavira came up during this stage and a remarkable system of water reservoirs, which took advantage of the 13 m north-east–south-west gradient of the site and were partly rock-cut, followed the inner alignment of the peripheral wall. That Stage III marks the phase of transition to the mature Indus civilization is also shown by the presence in this level of square or rectangular uninscribed steatite seals with Indus motifs, the occurrence of a potsherd with two Indus script signs painted on it and a typical Indus 'weight'.[21]

## TOWARD THE INDUS CIVILIZATION[21]

Until now the basic archaeological evidence related to the growth of village occupation west of the Delhi-Aravalli-Cambay axis of Indian geography has been outlined. If more space has been devoted to Baluchistan than anywhere else, it is because of the relative abundance of archaeological data from that region. It is illogical to think that the Baluchistan archaeological evidence lies in a straight arrow-like direction to the growth of the Indus civilization. This is a riverine civilization and the basic transition to it could not take place in the constricted world of the Baluchi hill valleys. As we shall see later, many of these Baluchistan areas were penetrated by the Indus civilization, and we have already argued that by the time of Mehrgarh VII and Damb Sadaat II–III, the Indus civilization had already developed in the Indus–Hakra plain. It is in this plain that the course towards this civilization has to be understood and assessed.

The area which comes immediately into focus is Cholistan along the Ghaggar-Hakra course—99 sites with a definite site-size hierarchy and evidence of craft-specialization in a narrow geographical zone. Mughal has drawn attention to the occurrence of some sites with Hakra ware outside this zone: about 25 sites in the Pakistani Punjab doabs as far as Multan (the site of Jalilpur) and Faisalabad, and on the Indian side we can add to this one site in the Kalibangan area of Rajasthan and one site (Kunal) near Hissar in Haryana. However, it is in Cholistan that the distribution is most dense, and from this point of view, sites beyond Cholistan may be comparatively later than the Cholistan sites. Besides, although Hakra ware has been found in the first phase of occupation at Jalilpur in Multan, do we consider it as a classic Hakra ware culture site? We do not know, because

no classic Hakra ware site in Cholistan has been excavated. Further, Mughal's opinion that the Hakra ware culture goes back to the very beginning of the fourth millennium BC is no doubt right, but the point is: what about the presence of Hakra ware in the early level of Sheri Khan Tarakai in Bannu, which falls in the second half of the fifth millennium BC? Does the Hakra ware culture go back to this chronological phase too? Finally, what is the origin of this settlement phase in Cholistan? In the form in which we perceive it today, it is a fairly developed cultural phase. How did it spring in Cholistan? Till a Hakra ware site in Cholistan is excavated we are unlikely to receive answers to these questions. However, the evidence of a well-settled agricultural life is clear in whatever we know from the site distribution in Cholistan and excavations at Jalilpur and Kunal, although the latter need not be as early as the Cholistan sites. This no doubt marks the first well-defined archaeological phase of the Indus-Hakra plain moving towards the Indus civilization.

The ramifications of the next phase, generally known as the Kot Diji or Kot Diji-related phase, are much wider. Again, its core distribution area is Cholistan, and it is here that it is assumed to have its earliest stage of development. The existence of more than one stage of this cultural phase is apparent from the excavated evidence at Harappa, Rehman Dheri and Dholavira. The first stage at Harappa and Rehman Dheri seems to fall in the second half of the fourth millennium BC, and on that basis, a date around the middle of the fourth millennium BC for the beginning of this phase in Cholistan is a possibility. There is a clear picture of its expansion in a wider area to form the back-drop of the Indus civilization, although the dates vary from site to site or from area to area. Considered in totality, this marks both consolidation and expansion of agricultural life all over the Indus-Hakra plain, and when one considers along with this, its planned, fortified settlements, an extensive but partly standardized repertoire of ceramic forms and designs—some of which are carried over into the Indus civilization—metallurgy, plough agriculture, miscellaneous crafts, wide transport and exchange of raw materials, ritual beliefs embodied in a wide range of terracotta cattle and female figurines, potter's graffiti, square stamp seals with designs, the presence of at least two signs of Indus writing both at Padri and Dholavira, the presence of a 'weight' at Dholavira and equally importantly, the fact of its having the same distribution area as the Indus civilization, one realizes that the term 'early Harappan' is appropriate for this phase. The extent to which it imparted uniformity over its entire distribution area cannot be assessed without further research, but as far as we understand it, a common cultural ethos spread with this phase all over the Indus-Hakra plain and adapted itself to

the local contexts. These contexts may not always be clearly defined everywhere, especially in the Indus-Hakra plain, but they presumably existed. The efflorescence of a rich metallurgical centre in the Aravallis in the second half of the fourth millennium BC is a good indication of the existence of such regional diversities within an otherwise integrated world of the Indus-Hakra system.

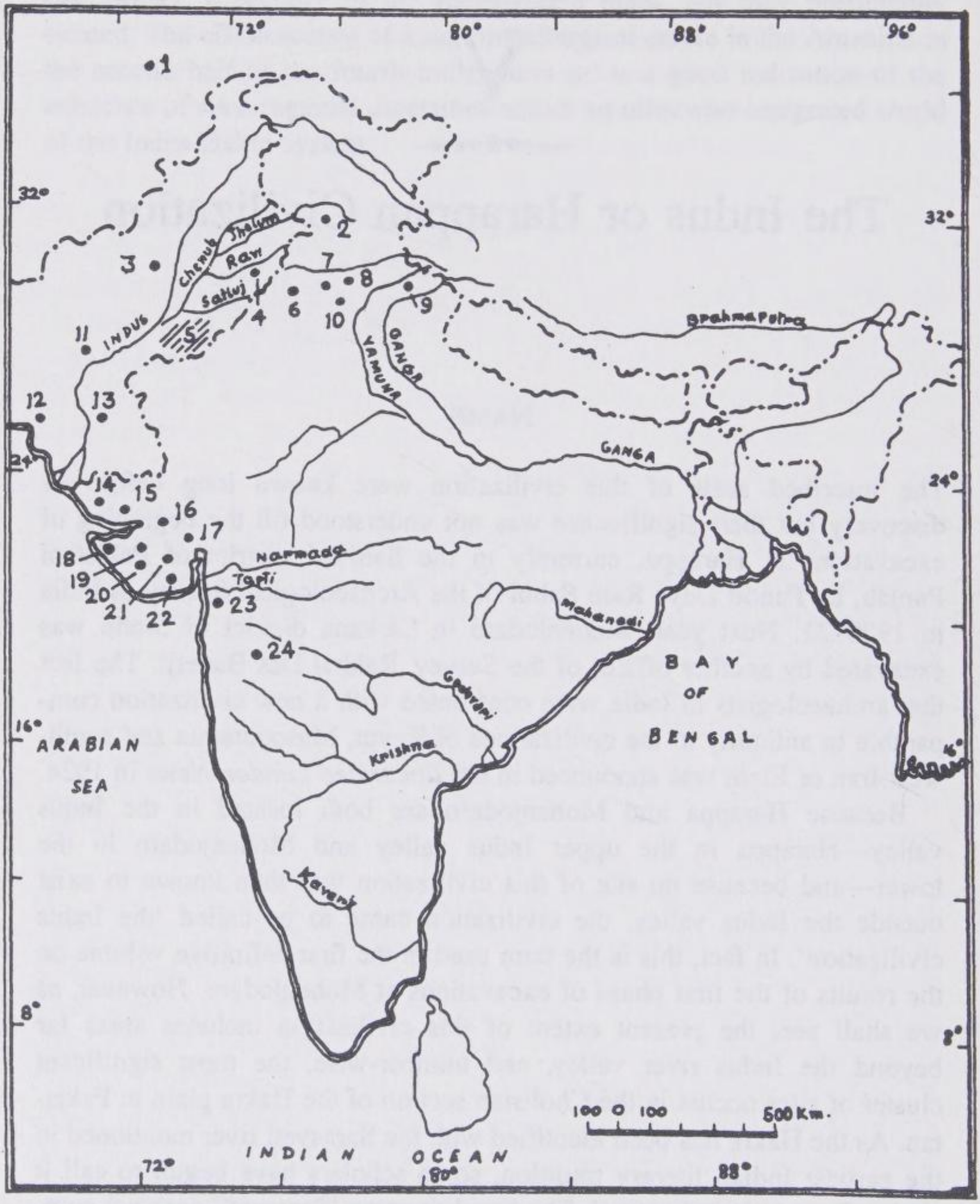
# V

# The Indus or Harappan Civilization

## NAME

The inscribed seals of this civilization were known long before its discovery but their significance was not understood till the beginning of excavations at Harappa, currently in the Sahiwal district of Pakistani Punjab, by Pandit Daya Ram Sahni of the Archaeological Survey of India in 1920–21. Next year, Mohenjodaro in Larkana district of Sindh was excavated by another officer of the Survey, Rakhal Das Banerji. The fact that archaeologists in India were confronted with a new civilization comparable in antiquity to the civilizations of Egypt, Mesopotamia and southwest Iran or Elam was announced in the *Illustrated London News* in 1924.

Because Harappa and Mohenjodaro are both located in the Indus valley—Harappa in the upper Indus valley and Mohenjodaro in the lower—and because no site of this civilization was then known to exist outside the Indus valley, the civilization came to be called 'the Indus civilization'. In fact, this is the term used in the first definitive volume on the results of the first phase of excavations at Mohenjodaro. However, as we shall see, the present extent of this civilization includes areas far beyond the Indus river valley, and number-wise, the most significant cluster of sites occurs in the Cholistan section of the Hakra plain in Pakistan. As the Hakra has been identified with the Sarasvati river mentioned in the earliest Indian literary tradition, some scholars have begun to call it 'Indus-Sarasvati civilization'. The Sanskrit name 'Sarasvati' does not combine well with the (originally Greek) modern term 'Indus', and thus the term should be either 'Indus-Hakra' or 'Sindhu-Sarasvati', 'Sindhu' being the Sanskrit name of the Indus. Although this term includes what is perhaps the core area of the origin of this civilization (i.e. a section of the Hakra plain), this in no way reflects its vast extent covering such areas as




*This map is neither accurate nor to scale*

Map 4 Some Major Sites of the Indus Civilization 1. Shortughai, 2. Manda, 3. Gumla, 4. Harappa, 5. Cholistan sites, 6. Kalibangan, 7. Mitathal, 8. Banawali, 9. Hulas, 10. Rakhigarhi, 11. Mohenjodaro, 12. Balakot, 13. Chanhudaro, 14. Dholavira, 15. Surkotada, 16. Nagwada, 17. Lothal, 18. Nageswar, 19. Kuntasi, 20. Rojdi, 21. Rangpur, 22. Padri

Baluchistan, Gujarat and a part of the Ganga-Yamuna Doab. The most logical term would be 'the Harappan civilization' on the accepted model of naming archaeological cultures after the names of the sites where they are discovered or first identified. In this volume the terms 'Indus civilization' and 'Harappan civilization' have both been used.

## DISTRIBUTION[1]

The outermost site of this civilization is Shortughai in north-eastern Afghanistan, about 25 km away from the Kokcha, a tributary of the Oxus. The results of excavations at this 2.5 ha site have clearly established its Indus civilization identity, and show that 'no one lived on this part of the plain before the Harappans'. At the same time, the settlement shows a close adaptation to the landscape, down to the establishment of a canal system which brought water to the site from the Kokcha using a skilful lay-out and the local topographical features. On the other hand, flax seeds found in a ploughed-up field outside the irrigated tract suggest dry-farming too. It is inconceivable that as a Harappan site Shortughai existed in isolation; the possibility of other Harappan sites being located in this area is indeed strong, especially in view of the miscellaneous evidence of Harappan contact (which we shall consider later) with the Bactrian area of north Afghanistan, a little to the west of the area where Shortughai is located. Shortughai could not have been reached without passing through south Afghanistan and crossing the Hindukush, but no positive sign of Harappan contact has yet been obtained from this sector of Afghanistan. Obviously, the location of Shortughai is still problematic and nothing can be said about it beyond a general inference that it was probably located where it is because of the access it provided to lapis lazuli of Badakhshan and possibly tin and other resources of central Asia. This site also brings to the fore the significance of the Oxus-Indus interaction zone to which we have drawn attention in the context of the Baluchistan archaeological assemblages.

What is interesting about the location of Harappan sites in Baluchistan is that they are localized in the areas which witnessed considerable village-growth in the earlier periods. Three clear factors have played roles in their distribution in this region. On the Makran coast, the two major reported sites—Sutkagendor (excavated) on the Dasht river and Sotka-koh (unexcavated) on the Shadi Kaur—have been credited with being ports of the Indus civilization's maritime links with the Gulf region and Mesopotamia. An equally strong, if not stronger, possibility is that they served as the entry points to the interior of this section of Baluchistan through the other-

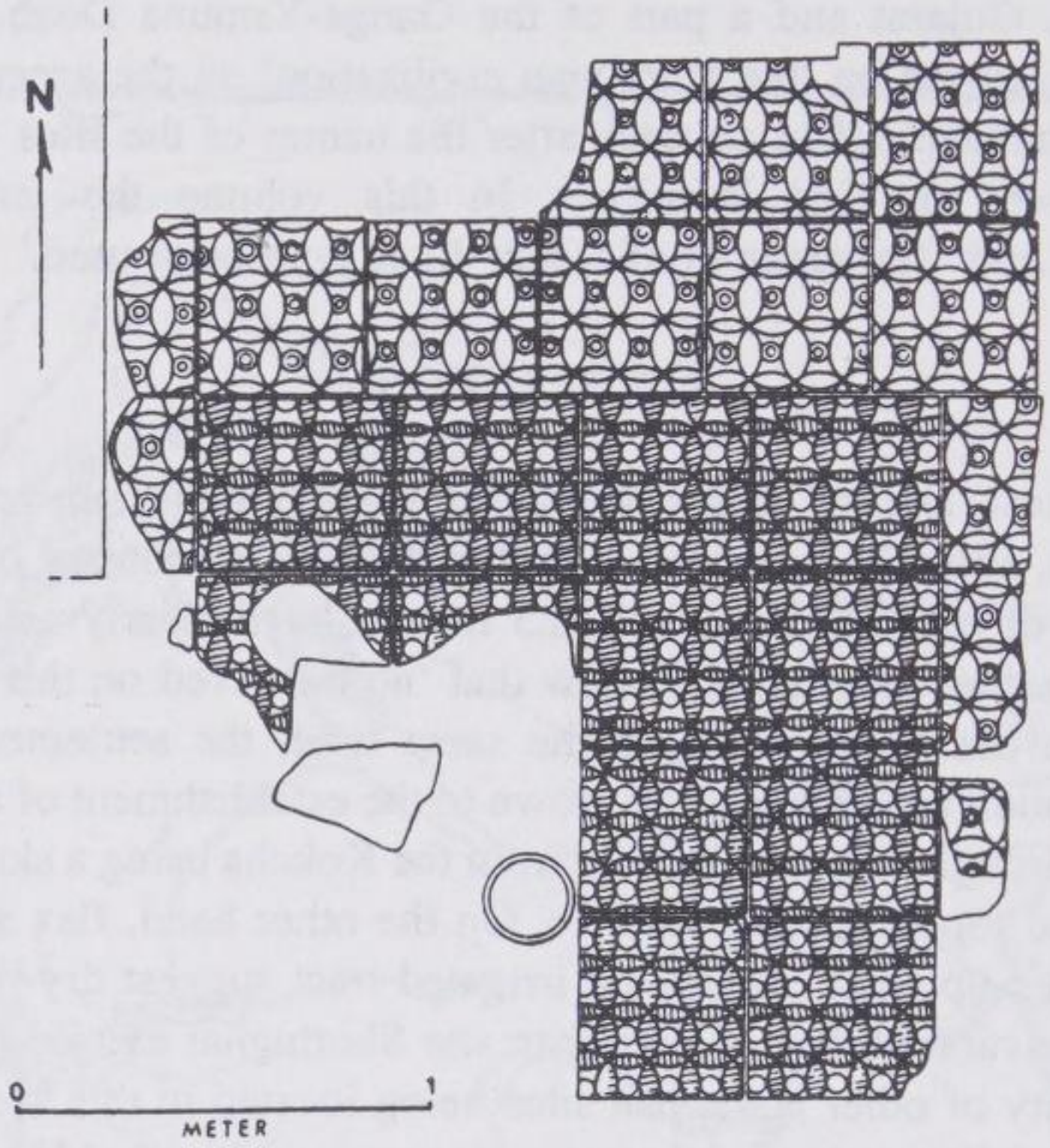



Fig. 17. Floor design in mature Harappan at Balakot. An identical design occurs on top of the Bodhi throne (3rd century BC at Bodh Gaya)

wise difficult Makran coastal range. Beyond the coast, in the Turbat oasis, the Harappans settled at Miri Qalat and perhaps in the Panjgur oasis as well. The agricultural fertility of these oases and their location on routes made them the foci of Harappan and earlier settlements. Proceeding east, the Harappans settled at Balakot in the Khurkera alluvial plain at the edge of the Sonmiani Bay, both for agriculture and access to the marine resources. In the interior of the south Baluchistan hills there do not seem to have been any Harappan settlements; it is more or less the evidence of Harappan contact that one has to look for at such sites as Kulli, Mehi and others, but again, the Harappans could not have ignored the network of both internal and external routes passing through these areas and their importance as a source of metals. The same situation prevails in the Kalat plateau and the Quetta valley, although the Bolan route to Afghanistan must have been very significant to the Harappans, because the major site of Nausharo (excavated) is in the area of entrance to this pass and was dependent both on this significance and on the general agricultural possibility of the Mehrgarh area. In the north-east, the Harappan level of Dabarkot (unex-

cavated) was possibly due more to its importance on the Afghan route through the Gomal valley than to anything else.

Another major site, Pathani Damb, is clearly important because of its position at the Baluchistan mouth of the Mula pass across the Kirthar range. On the whole, the Harappan sites in Baluchistan continue the settlement pattern established in the earlier periods: 'only in those areas which are still agriculturally viable and lie on arterial routes of the region'. Added to these, one has to bear in mind the locations of lapis lazuli in the Chagai hills and copper and lead in the hills between Nal and Las Bela.

The earlier occupational sequence in the Gomal valley was topped by a Harappan occupation at Gumla, and there is at least one more reported Harappan site in this area. It is not difficult to guess that they were there both for the agricultural potential of this area at the edge of the Indus alluvium and for the Gomal route to Afghanistan. No Harappan site is, however, reported from Bannu and the Potwar plateau.

The configuration of the Indus-Hakra plain, as drawn by Louis Flam on the basis of aerial photo-composites and ground surveys, is crucial to the understanding of the locations of Indus civilization sites in Sind. His basic map shows a large part of Sind lying between the channels of the Indus on the west and the Hakra on the east, with a large part of the present delta below modern Hyderabad being possibly a part of a large inlet of the Arabian Sea. The Rann of Kutch was a part of this inlet, and thus, the present-day Kutch would have been an island or a group of islands in a tidal sea. Similarly, it is possible that Saurashtra also was cut off from the mainland Gujarat. What is interesting about the map produced by Flam is that it shows both Shikarpur and Mehar (with Mohenjodaro in between) on the left bank of the Indus, whereas these days they are located on the right bank of the river. Although 20 Harappan sites have been reported by him in the lower Indus basin, including about 13 sites between the Indus and the Hakra, it is difficult to be certain about the nature of distribution of these sites east of the Indus. West of the modern Indus the sites, with the exception of a few like Mohenjodaro, fall mostly in the Kirthar foothill zone and Kohistan where their locations can be understood in relation to the landscape.

Mohenjodaro is located in the agriculturally richest part of Sind, i.e. the fertile and rice-growing plains of Larkana. Shikarpur, the famous entrepôt of commerce located almost at the mouth of the Kachhi plain and thus of the caravan trade through the Bolan pass, lies in an area which is only a little upstream from Mohenjodaro, and it is just possible that in proto-history the Bolan trade came down to the plains and the river at Mohenjodaro. From the Mohenjodaro side a shorter approach to the Bolan pass

across the Kalat plateau is through the Mula pass, and we have already noticed the location of a major site (Pathani Damb) on the other side of this pass.

Along the western border of Larkana is the Kirthar range (of its total length of 240 km, 90 km are in Larkana). In the Kirthar foothill zone agriculture is limited and 'depends chiefly on irrigation provided by damming the torrent-beds when there is a rush of water from the hills during the rains.' Some of these water-courses are spring-fed and thus perennial. Their water is used for irrigation, 'being carried off wherever necessary by means of channels.' There are also a few lake depressions in the Larkana area, the most famous being the Manchhar lake. In the map prepared by N.G. Majumdar on his explorations in Sind there is a cluster of sites around this lake which he identifies with the fishing settlements of the Harappan period. Another cluster of sites lies in Kohistan, further to the south. Agriculture depends here on spring water and moderate rainfall. Majumdar also mentions some local routes passing through this section and apparently, the location of sites here was dependent not merely on easy access to spring water but also on their position along these routes. Towards Karachi he reported two sites—Amilano and Orangi—and more recently, another site—Ahladino—has been noted in the Karachi area. To the east of the Indus, Majumdar's major site is Chanhudaro, almost due west of the site of Amri, with a ferry crossing across the Indus at this point.

More data have now begun to emerge from upper Sind, especially from the area of the Sukkur-Rorhi hills where huts of Harappan workmen who quarried local flints have been found in addition to a number of sites along the present Nara canal which was once linked to the course of the Hakra. A major site here is Lakhianjodaro. A heavy concentration of sites has been reported between the Indus and the Hakra bed, possibly along the spill channels joining these two systems.

The largest cluster of 174 Indus civilization sites is around and to the west of modern Derawar fort on the Hakra. In the west they extend up to Rahimyar Khan but this may also mean that the sites further west could have been buried under drift sands or simply destroyed. According to the explorer Mughal's estimate, 79 of these sites are 'purely industrial sites, meant exclusively for the large scale production of fired bricks, pottery, and items of daily use, including perhaps metallurgical activities such as the melting if not the smelting of copper or bronze'. In addition, 33 settlement sites possess kilns, which suggests specialized craft activities as a part of the habitational complexes. There are 50 purely settlement sites and the rest are so-called camp-sites, possibly indicating the existence of nomads. The following size categories are known: up to 5 ha: 44 sites; 5.1–

10 ha: 20 sites; 10.1–20 ha: 8 sites and over 80 ha: 1 site. The largest site of this cluster, Ganweriwala Ther, has two close-set mounds (503 × 533 m and 488 × 290 m; maximum height 8 m) covering an area of 81.5 ha.

In Pakistani Punjab there are sites in the Bari Doab (between the Sutlej and the Ravi), mostly along an old bed of the Beas. Harappa, located on an old bed of the Ravi, is in this sector. Sites are found sporadically even beyond the Ravi but are focused around Sheikhpura west of Lahore. Further west, till the Indus, there is no site in Pakistani Punjab, which is in keeping with the arid conditions of the Sindsagar Doab between the Jhelum and the Indus. There is no site in the Jech Doab (between the Chenab and the Jhelum) either.

To the east of the Sutlej lies the transitional zone between the Indus and Ganga systems which is known as the Indo-Gangetic divide. Its boundaries lie between the Sutlej and the Yamuna and between the Himalayan foothills of Indian Punjab and the course of the Ghaggar (Hakra in Bahawalpur, Pakistan) in Rajasthan. This is a vast area, comprising mainly the Indian states of Punjab, Haryana and Delhi. From the foothills beyond Chandigarh and the Aravalli ridge of Delhi the sweep of alluvium till the Rajasthan desert near Suratgarh is impressive. From the present point of view what stands out clearly in this region is the number of drainage channels which come out of the foothills and once combined in various ways to form the channel of the Ghaggar-Hakra, identified with the Sarasvati of the ancient Indian tradition. All the drainage channels of this region are ephemeral and the reason for the drying up of the Ghaggar-Hakra is an important issue by itself. What has been inferred, primarily on the basis of the palaeo-channels traced through remote-sensing imagery, is that the present-day Sutlej and the Yamuna were once flowing into the Ghaggar-Hakra channel and after they were captured, respectively, by the Indus and the Ganga, the Ghaggar-Hakra system dried up, although retaining some water in the upper reaches during the monsoon. This extinct river system was once alive and its impact on the human settlement can be imagined. One has to visualize, during the time of the Indus civilization, a great swath of alluvium which began at the mouth of the Rann of Kutch, included the Indus-Hakra Doab in Sind, expanded to take in the Punjab plain between the Ravi and the Sutlej, and moved up along the Hakra at the edge of the Great Indian Desert (Thar in India and Cholistan in Bahawalpur, Pakistan) to the Simla foothills and Delhi and beyond. It must also be remembered that climatically this entire belt falls in the arid/semi-arid zone.

It may be interesting to know at this point that the whole of Sind, Baluchistan and a large part of the Hakra system and Punjab plain enjoy

only 80 to 160 cm of annual rainfall, and in this large area there is a central sector covering parts of Baluchistan and the central Indus valley, which receives rainfall of only up to 80 cm. The next two annual rainfall belts of 160–240 cm and 240–320 cm are in the next section up to Lahore and Kutch. The rest of the area, including the Punjab foothills, Delhi, Saurashtra, etc. experiences an annual rainfall beyond 320 cm, going up to 640 cm in certain sections. The much-debated issue of the 'Indus' climate has been undecided regarding the suggestion of more rainfall in the protohistoric past. If anything, the analysis of calcium carbonate nodules from Harappa suggests a dry climate. According to a report in the *Eastern Anthropologist* (1992) 'the carbon isotope ratios of pedogenic carbonate in inner portions of nodules forming at Harappa reflect an arid climate with a very low soil respiration rate.' There is also doubt about the date of desiccation of the Ghaggar-Hakra system. Micromorphological studies of soil in Haryana have led to the inference that right in the first phase of human occupation of the region, the Ghaggar was a dying river, flowing in shallow braided channels through a 6–8 km wide bed and receiving its water mostly during the monsoon.

A site count published in 1984 showed about 138 classic Indus civilization sites in Uttar Pradesh, Haryana, Punjab and Rajasthan. The Uttar Pradesh sites (Saharanpur and Meerut districts) are all from the Ganga-Yamuna Doab. In the Indo-Gangetic divide zone of Indian Punjab, Haryana and Rajasthan the relevant site-count is 107. The largest site—Rakhigarhi in Hissar district—is said to be as large as Harappa. Excavations have just begun at Rakhigarhi, but the extent of the other major excavated sites of the region—Kalibangan (*c.* 12 ha or more), Banawali (*c.* 5 ha or more) and Mitathal (*c.* 7 ha) is much less. In Uttar Pradesh, the major excavated site is Hulas (*c.* 5.5 ha) in Saharanpur district. A serious problem regarding site distribution in this region is the apparent cluster of very large sites (one as large as 225 ha, but there are 4 others with 100 and more hectares) in the Mansa area of Bhatinda district, Punjab. These sites are unexcavated, briefly reported, and no explanation regarding their size is forthcoming.

The classic Harappan site count in Gujarat in 1984 was 101 : 30 in Kutch; 12 in mainland Gujarat, and 59 in Saurashtra. The maps show their distribution along the dendritic river systems of the Kutch and Kathiawar peninsulas and the estuarine regions of the mainland coast. Dholavira, which is more than 100 ha (approximately half of it covered by walled settlement), is the largest site in Kutch, but the other Gujarat sites are much less in extent. Lothal, Surkotada, Padri, Kuntasi, Rangpur and Rojdi are among the major excavated sites of this region, which, because of its coast and raw materials

(cf. semi-precious stones, copper and other minerals) must have been important in the Harappan scheme.

Apart from its basic geography and site localization, perhaps the most important characteristic of the distribution of classic Harappan sites is their adaptation to the diverse settings from Baluchistan to the upper section of the Doab and from Manda in Jammu (as an extension of the Punjab sites) to the estuarine area of mainland Gujarat. In this task of regional adaptations they were preceded in all the areas by the cultural level which is now almost universally called 'early Harappan'. At the same time, the distributional picture which has emerged is a flat picture. Does it mean that the classic Indus civilization appeared more or less simultaneously all over its basic distributional zone?

It is improbable that it did so. On the basis of the sheer density of site distribution, both in the classic Harappan and earlier periods, the core area of the growth of the Indus civilization seems to be the explored Cholistan section of the Hakra plain: Hakra ware sites: 99; early Harappan sites: 40; mature or classic Harappan sites: 174. Significantly, they all lay in an area which measures, along the Hakra course, only about 200 km and not more than 50 km at any point across the breadth. Once it had developed in this apparently limited area, it was not at all difficult for this civilization to come down, along the Hakra, to Kutch first, and then to Saurashtra. It should also have spread quickly to the Hakra-Indus Doab including the Mohenjodaro area, as Mughal's map (Mughal, 1997) suggests. Similarly, central Indus valley up to Harappa between the Ravi and the Sutlej came in for occupation. The Indo-Gangetic divide too was possibly occupied during this phase. The Baluchistan settlements or the settlement of Shortughai were probably parts of the thrust towards the Mohenjodaro area, while the upper section of the Ganga-Yamuna Doab was possibly settled later. All these areas, except the Doab section, have clear archaeological evidence of earlier settlements; in the Pakistani Punjab plains and at least in a part of the Indo-Gangetic divide the first phase of these settlements is marked by Hakra ware. In the rest of the plains and the Gujarat region the substratum is not earlier than early Harappan. In Baluchistan, of course, there is a much earlier beginning of settled life. In the Doab there is no documentation before the classic Harappans moved in, and in Gujarat the microlith-using hunter-gatherers lay in the background. On the whole, the distribution density is interesting: concentration and a long time-depth in a particular area, and a reasonably dispersed character with a lesser time-depth of earlier occupation elsewhere. One would also infer that the process of geographical dissemination was a more or less continuous phenomenon over a long span of time. The Indus-Hakra alluvial system

alone offered them the opportunity of a tremendous and uninterrupted expansion, in the course of which the settlements could come up as defined and dispersed units, at least as long as the classic form of this civilization lasted.

## ORIGIN

The basic archaeological stratigraphy of the civilization distinguishes between its 'early', 'mature' and 'late' forms. The early form—archaeologically the Kot Dijian level—has been considered in the previous chapter, and while it is true that it developed a number of features related to the mature or classic Harappan form, there is also an apparent element of abruptness in the appearance of the mature form in all its splendour, especially writing, multiplicity of art forms and the general scale of things. There is nothing intrinsically surprising about this seeming abruptness; a civilization is supposed to mean a qualitative change and it has never been easy to distinguish the precise span and process of this qualitative transformation in the archaeological record, whether in the Indus, Sumer, Egypt or elsewhere.

The fact that a transformation was taking place at a certain point in the sequence related to the emergence of the Indus civilization is clear at least at three excavated sites: Harappa, Kunal and Dholavira. At Harappa, the upper levels of the early Harappan phase suggest, according to the excavators, a gradual transition to the classic civilizational phase characterized, among others, by the construction of habitation areas along a grid of north–south and east–west streets. At Kunal, Period IC shows even mud-bricks in the classic Harappan ratio of 1:2:4, a drainage system based on soakage pits in the streets, square (although uninscribed) and knobbed steatite and shell seals, typical classic Harappan copper arrowheads, a large number of semi-precious stone beads and gold and silver ornaments containing not merely silver tiaras and 'armlets' but also disc-shaped gold beads associated with the Indus civilization. At Dholavira, it is only Period IV which is said to represent the classic Indus civilization but by stage IIIB the basic layout of the settlement was achieved along with 'diagnostic Harappan elements such as stamp seals, the script, weights and many typical pottery forms as well as decorative motifs'. The stamp seals are uninscribed but carry designs recalling those on a famous Mohenjodaro seal (*Siva Pasupati* seal), and the script is in the form of two fragmentary 'Indus' signs painted in black on a potsherd. The evidence of such an earlier appearance of 'Indus' signs has also been found at Padri. The published data are still incomplete but it appears that at Harappa,

Kunal and Dholavira we have eventually found the phase of transition to the Indus civilization.

The problem hardly ends here. How do we explain the process of transition? To a great extent the answer will have to be speculative, because the variables behind the emergence of a civilization, including the social and institutional changes are not always subject to categorical analyses, especially in the case of the Indus civilization where writing exists but, in the absence of its satisfactory decipherment, there is no literary testimony.

The variable which can easily be perceived in the archaeological record is the increasing level of craft-specialization in the transitional phase. This is manifestly apparent in the manufacture of pottery on a commercial scale (production of specific types of vessels), in the presence of bangles of a particular type of shell (*Turbinella pyrum*), and blades made of cherts derived from the Sukkur-Rorhi hills of upper Sind in the relevant context at Harappa. The same context at Kunal shows large-scale metallurgy, seal-making, extensive familiarity with different types of stone beads and jewellers' crafts in gold and silver. The transitional phase at Dholavira shows the beginning of script, the manufacture of seals and weights, the standardization of mud-bricks in the 'Indus' ratio and the burgeoning of potters' craft antedating many features of the 'Indus' style.

This increasing level of craft specialization was probably set in motion by the development of copper metallurgy along the Aravallis, to which we drew attention in the previous chapter. By the late fourth millennium BC, this metallurgical tradition was fully in place and must have closely interacted with the early Harappan tradition of Cholistan and the Indo-Gangetic divide. In fact, around this time the thrust of this metallurgy could have been only towards the Indus-Hakra plain, because there is as yet no clear village tradition outside the orbit of the early Harappans and the still earlier Hakra ware tradition. The basic locale of this metallurgical tradition comprises the copper-bearing areas of north-east Rajasthan and its extensions in the Narnaul area of Haryana and the tin-bearing hills of the Tosam area of Haryana. This is a distinct centre of early metallurgy of which we do not have much detail. However, the hypothesis that it played a catalytic role in the intensification of craft activities before the emergence of the Indus civilization is well rooted in the available knowledge. The increasing level of craft specialization must also have warranted a more extensive and quantitatively significant dissemination of various types of raw materials, increasing the pace of integration of different areas along geographically defined routes. This, in its turn, helped to demarcate and stabilize the various social groups involved in craft production and trade.

Another major variable is the probable emergence of an organized

irrigation system at this point. The major geographical argument in its favour can still be given only in the context of Sind, but the idea that the Harappans had an extensive irrigation system has been put forward in recent years in the context of the Indo-Gangetic divide by R.S. Bisht and H.P. Francfort on the basis of their field-studies in the region. Moreover, the network of irrigation canals around Shotughai in north Afghanistan was indisputably established before that. In the previous chapter we have also drawn attention to Fairservis' inference that a trench at the western edge of Amri IA settlement was a canal. According to R.S. Bisht, during the protohistoric period people

> apparently dug canals for irrigating fields and storing water in large ponds. The existence of a network of abandoned canals and river beds, dotted with numerous chalcolithic and Early Iron Age sites, in the Sarasvati valley in Haryana bears testimony to this.[2]

Francfort's opinion too is worth quoting in detail:

> The canals are slightly carbonated depressions about 1 m deep and 300–500 m wide. They mark the courses of ancient natural waterways which were used and perhaps, in some places, rerouted by man. These traces of small river channels . . . appear to have reached all of the archaeological sites. . . . Not only did they supply with water but at the same time they made the surrounding area more fertile than the natural plain. . . . The picture we are left with is that of a small-scale system, less impressive than the great hydraulic works of Mesopotamia or Central Asia during the same period. But here, as well as there, the spatial unit is the network, or the branch, or the cluster of networks which mark the ground and define the irrigable areas for farming.[3]

Bisht's and Francfort's observations and conclusions are valid only in the context of the Indo-Gangetic divide. As far as the Indus-Hakra plain is concerned, we begin by pointing out two archaeological features, both of which suggest a manifold expansion of settlements from the early Harappan level to the classic Harappan or Indus civilization level. First, 'the number of sites in the lower Indus basin increases from 3 during the Amri–Kot Diji phase to 20 during the Harappan phase', and secondly, as Mughal shows, in the Hakra plain of Cholistan this increase is from the 40-odd sites of the early Harappan phase to 174 sites of the Indus civilization phase. This expansion of sites in the Indus-Hakra flood-plain can be best explained by invoking the beginning or an expansion of an irrigation network in this flood-plain during this period.

No archaeological evidence of irrigation canals has been looked for in this region, but the ethnographic evidence makes our hypothesis probable. According to *The Imperial Gazetteer of India* published in 1908, the bed of the Indus is higher than the level of the surrounding plain and, as in

Mesopotamia, affords 'an easy means of irrigation, on which the agricultural prosperity of Sind entirely depends, by side channels drawn from the central river'. This gazetteer describes the pre-industrial agricultural regime of Sind: two principal harvests—the spring or *rabi*, sown in September, October, or November, and reaped in February, March, or April; and in autumn *kharif*, sown during the floods of the river from May to August, and reaped from October to December. The importance of irrigation in a province where the rainfall averages only 130 cm annually, with occasional failures, is obvious, and this is what the gazetteer narrates:

> The dry character of the soil and the almost absence of rain render irrigation a matter of prime importance. Sometimes, indeed, for two or three years in succession, no rain whatever falls in the province. Under these circumstances the Indus is to Sind what the Nile is to Egypt. When the province was annexed in 1843, numerous irrigation canals existed which derived their supply direct from the river. These canals are carried away from the river bank in the direction the water can most easily flow to reach the fields that are to be irrigated. None of them has its head where the bank is really permanent, and they can draw off water only during the inundation season. The river must consequently rise several feet before the canals will fill. Many of these canals are but old deltaic channels, reopened and extended, and all have the appearance of rivers rather than artificial cuts.[4]

The picture becomes a little more clear from the data given by David Cheesman (1997). Rainy season brought about low shrub and cactus on the sandhills of the adjacent desert, turning the whole area into a grazing ground. In the level areas between sandhills, where water collected, some cultivation was possible, and to the west, at the foot of the Kirthars, water from flash-floods could be trapped with embankments. Cultivation from natural overflow of the Indus (*sailabi* method) was also possible but not without some dangers. The land could become choked by tough grasses before the waters subsided, thus preventing seeds from being sown in time. Second, uncontrolled flooding created tracts of salt-impregnated soil, and third, the waters might not recede in time for crops to be sown. Cheesman points out that in 1904–5 only 253,457 acres of land in Sind were cultivated by the sailabi method, whereas 2,802,962 acres, i.e. more than 11 times of the sailabi land, were cultivated by irrigation from canals.

Before the modern barrages were built, irrigation was provided through 'inundation canals'. These were fed by overspill from the Indus during the inundation and were dry for the rest of the year. A typical inundation canal system consisted of a main canal, known as a 'feeder', which 'took off' (i.e. received water directly from) the river, then distributed its waters into a number of branch canals known as 'distributaries'. These in turn might act as feeders for other distributaries. The point at which a canal took off its feeder was referred to as its 'head', the other end

as its 'tail'. Water was brought from the branches to the fields by *karias* (water courses).

. . . There were two methods of cultivating from canals: *moki* or 'flow' cultivation, through natural overflow from a *karia*, and *charkhi* ('lift') cultivation, where water physically had to be lifted into the field. . . . Most farmers used both methods, often within the same season.[5]

For efficient working, this canal system had to ensure the proper positioning of the heads (they had to be in places where the river bank was permanent and the canal mouths were not eroded or blocked by silt) and at the end of each season the beds had to be got rid of their deposits of silt. The task of canal clearance was very important in the pre-industrial agricultural life of Sind and this was certainly a cooperative affair in which 'individual agriculturists might have to rely, not only on their own hard work, but on the energy and dedication of their neighbours'.

There is nothing in this scenario which was not possible during the protohistoric period, and we suggest that its induction made large-scale agricultural settlement of the Indus plain (and possibly the Hakra plain as well) possible and set the society, along with the increasing level of craft specialization, on its course toward the Indus civilization.

The social–institutional changes are no doubt uncertain, but one notes that the type of jewellery obtained from Kunal is still associated with affluence and aristocracy in India. This suggests the emergence of an elite class and this picture is further reinforced by the way the multiple divisions of urban space got crystallized even before the emergence of the full-fledged Indus civilization at Dholavira. When one thinks that irrigation and the general system of water management had to be a socially controlled affair, the possibility of the emergence of a controlling or ruling nucleus on this basis becomes clear.

## Morphology of Some Major Sites[6]

### *Mohenjodaro*

Mohenjodaro in Sindhi means 'mound of the dead'. It was first excavated in 1920–21, and then between 1922 and 1931. The site comprises two mounds—the higher but smaller western mound and a much larger but lower eastern mound, both separated by an open space and about 5 km west of the present bed of the Indus. Excavation in the early years was conducted in both the mounds. In 1950, Wheeler excavated only in the western mound, and in 1964–65 G.F. Dales (1965; Dales and Kenoyer 1986) excavated at the western edge of the HR section in the south-western

corner of the eastern mound. In modern times, the condition of the excavated burnt-brick ruins has deteriorated because of the underground salt action. This led to the programme of rigorously documenting everything related to the site, which has been completed in recent years under M. Jansen.

There is no positive evidence that the site ever stood on the bank of the Indus or that the river sent any branch or canal to it. The present open space between the two mounds was open in the past too. The limits of the site are ill-defined. The visible space is *c.* 95 ha, but Jansen's survey has traced ruins up to about 2 km to the east. It is possible that these newly discovered ruins belong only to the late phase of the site's history, but still, the total built-up area is now estimated to be *c.* 200 ha. Because of sub-soil water no excavation could reach the earliest occupational deposit. On the basis of two deep borings in the present plain outside the HR section, Dales wrote that the traces of occupation were found till a depth of 12 m below the present ground level. The height of the mound above the present ground level was 10.5 m feet. This means that the total occupational deposit in this part of the mound is 22 m in all. The sub-soil water was encountered at the depth of only 4.5 m below ground level, and this meant that the excavator had to leave 7 m of occupational deposit at that point unexcavated. This tells us very clearly that the early level of Mohenjodaro is unknown.

An interesting argument has been offered to explain the occurrence of artefacts at a depth of 12 m below the present ground level. This explanation is based on the fact that the two mounds of the site were both built on huge man-made platforms of mud and mud-brick. To get clay for these bricks, the builders of Mohenjodaro must have dug in the immediate area, and thus created a wide and deep ditch around it. As people living in houses built on the top of the two platforms threw rubbish in this ditch, artefacts would be found at a much lower depth than the level of the actual occupation. It is an interesting hypothesis but certainly not beyond doubt. There may be a substantial depth of unexcavated early occupation deposit at Mohenjodaro.

If one leaves aside the still undocumented and presumably late extension of the city to the east, the urban configuration of Mohenjodaro centres around its western and eastern mounds.The occupational remains in the western mound, at the north-eastern corner of which is a Buddhist stupa of the early centuries AD, were built on top of an artificially constructed mud and mud-brick platform which measured approximately $400 \times 200$ m. There was a 6 m thick mud-brick retaining wall around it, with its height rising above the level of the platform. There are traces of salients or projec-

tions from this wall on the south-west and the west. A tower on this salient has been excavated on the south-east. Access to the top of the platform was probably by a stairway going down to the level of the plain. No trace of this stairway has survived.

The stupa area at the north-east corner of this mound, which also represents its highest point, has not been excavated, and this presumably marked the most sacred spot of the site. There is a road called 'Divinity Street' in front, and across this street (*c.* 2–3 m wide) is what has been named a 'college' of priests mainly because of the thickness of its outer wall, size (*c.* 70 m × *c.* 24 m), composition as a single architectural unit, and proximity to the inferred sacred spot. In the same sector there is another building which shows four bathroom-like rooms on either side of a passage with a covered drain. The inference is that priests used to live on the top floor of this complex and they had a special suite of bathrooms. There are three other interesting complexes in the western mound. First, there is the Great Bath which is basically a *c.* 14.5 m × *c.* 7 m burnt-brick-built pool sunk *c.* 2.43 m below the level of the surrounding open brick-paved courtyard. It was accessed by steps which had wooden covers fixed by bitumen or asphalt. The sides of the pool had another set of walls surrounding them, with the intervening space between the two being filled with a bitumen coating and earth. Its water was drained by a large corbelled drain which went down the mound's western slope. Water to fill it was possibly drawn from the well found in one of the rooms fronting the open courtyard around it. The bricks for construction were laid on edge and made watertight by using gypsum as mortar. The whole complex had a 5 m wide road around it and was thus the only free-standing structure of Mohenjodaro, which could be walked around outside. To its immediate south-west is what has been called a granary. This complex was made of 27 mud-brick blocks with passages between them for smooth air-flow. Built integrally with it in the north was a loading platform made of burnt-bricks. The mud-brick blocks have been presumed to have had wooden superstructures which were filled with grain by standing on top of the loading platform which had an alcove at its eastern end. In the southern sector of the western mound is the so-called assembly hall. Roughly square in shape, this has 20 rectangular brick piers arranged in rows of five each and dividing the hall from east to west into five aisles or corridors. It would be incorrect to claim that all the houses excavated in the western mound fall into non-residential category, such as the ones mentioned here, but the very fact that the complexes like the Great Bath, the Granary, the 'assembly hall', the 'collegiate building' and the complex with eight bathrooms arranged in two rows existed in this area suggests its somewhat exclusive character.

When one considers, along with this, its general height and smaller size in relation to the eastern mound, the reason for it being called 'citadel area' becomes obvious.

In the eastern section we have one main north–south street ('First Street' of the excavators), traces of two more north–south streets at an equal distance (180 m) from the First Street and no evidence of a main east–west street. Excavations at the western edge of the HR area in 1964–65 revealed massive and solid mud-brick embankments with a series of at least 6 m high retaining walls of burnt-brick. This indicates the possibility of such surrounding walls around the entire periphery of the eastern mound. The excavated remains of the HR area provide a fairly clear picture of the arrangement of ordinary houses of Mohenjodaro, which were also built on artificial platforms of varying heights. The First Street (9–10.5 m wide), two smaller and roughly parallel side-streets to its west and a few lanes with sharp turns frame these houses whose main entrance is in general from the side-streets or lanes and whose main focus is either an open or lightly covered courtyard with rooms disposed in various fashions around it. Drains which were made of burnt-bricks and given a cover of stone slabs or burnt-bricks are fairly common in this area as elsewhere in the excavated parts of the city. Interestingly, two brick-built cess-pits in the First Street had a connecting brick drain between them to carry the surplus water of the northern pit to the southern one, which had in addition a series of brick-steps on one side so that somebody could go down and clean it. This regular cleaning arrangement of drains (general width 23 cm and depth 45–60 cm) is also clear from the little deposits of sand found along them. Even brick culverts (some as large as 75 cm wide and 120–150 cm high) to discharge the total water from the drains have been found in the outskirts of the site. The soak-pits placed at the mouths of water-chutes coming out of the houses were earthen jars with holes at the bottom. In the western part of the HR area, a double row of sixteen houses with a single room in front and one or two smaller rooms at the back has been interpreted as shops or working-men's quarters. In the VS area a house showed a room with five sunken brick-made hollows in which the bottoms of large jars could fit. As this room could be entered directly from the main road, the inference is that this could be a sweetmeat shop or a place where dyeing vats were kept. Within the range of such little variations the Mohenjodaro houses are standardized, and the speculations about their functions or ownership on the basis of their general size and thickness of walls do not really add up to much.

*Chanhudaro*

No fortification or urban wall could be traced at Chanhudaro, possibly located on an old bed of the Indus in Sind and excavated principally in 1935–36. Mud-brick platforms, miscellaneous structural ruins and traces of at least three streets—the main one 5.68 m wide and with two covered burnt-brick-built drains on two sides—and a lane have been excavated. On the eastern side of the main street is what has been called a bead-making factory on the basis of a large number of finished and unfinished beads there. Some evidence of a regulated town-plan has also been found at a few smaller excavated sites in Sind, such as Ali Murad (a partially traced fortification wall made of stone blocks), Kot Diji (a street and a lane) and Ahladino (an open court with a well and surrounding buildings with bathrooms and covered drains).

*Harappa*

The search for burnt-bricks, broken bits of which could be used as ballast by the builders of the railway line between Lahore and Multan led to the large-scale spoliation of this site which has a higher and smaller western 'citadel' section on the bank of an old bed of the Ravi and a larger and lower habitation area to the east. The structures inside the western mound are much too destroyed for any worthwhile excavation results, and the excavations at the site between 1920–21 and 1933–34 and in 1946 were mainly focused on the buildings between the western mound and the bed of the Ravi and on the cemeteries to the south of this mound. Cemeteries were, in fact, sporadically excavated even after 1946 but the modern phase of excavations at the site, which began in 1986 and is continuing through the 1990s, has made a conscious effort to investigate the habitational area on the east. The total area of the site, by modern reckoning, is *c.* 150 ha, out of which a *c.* 442 × 244 m area is occupied by the western mound and roughly a 300 m square area by the mound near the Ravi. The western mound was fortified with a wall with a burnt-brick revetment, which possessed a slope both inside and outside, a varying width, towers and salients, a set of terraces along the western edge for ceremonials and the main gateway presumbably in the north. The whole complex was raised on an artificial platform of mud and mud-bricks. There were three complexes near the Ravi: the 'Great Granary', constructed in two blocks with six halls raised higher than the ground on sleeper-like walls and with passages between them, about 18 circular platforms (11 m in diameter and all equi-distant—roughly a little more than 6 m—from one another) with their centred hollows being used for pounding grains, and a block of 14 small

houses which could have housed working people associated both with the pounding of grains and the sixteen copper-smelting furnaces found at a higher level near them. There are two cemeteries, named Cemetery R37 and Cemetery H, to the south of the fortified western mound.

The evidence of habitation in the eastern mound is still not very sharp, but the traces of small streets, drains and soak pits occur in its north-western section which also has a series of mud-brick platforms with burnt-brick retaining walls. A 5.4–6.5 m thick freestanding mud-brick wall of two structural phases has been traced for more than 73 m along the southern edge of the mound, and more interestingly, with a 2.6 m wide gateway. The walls associated with the gateway system are 9 m thick and their outer faces bear the traces of a burnt-brick cover of their otherwise mud-brick body.

### *Kalibangan*

Excavated between 1960–61 and 1968–69, the site is located on the bank of the dry bed of the Ghaggar and comprises two mounds—the smaller western mound and the larger eastern mound with an open space between them—and a burial ground to the west–south-west of the western mound. The western fortified enclosure (*c.* 240 × *c.* 120 m; 3 to 7 m wide and with rectangular salients and towers) was partitioned into two units by an inner wall with stairways on either side for movement between the two units. The southern unit had, on its south, a series of steps fronting the fortification wall which was provided with a passage across it at this point. Otherwise, this unit contained several mud-brick platforms, possibly with structures on them. These structures have disappeared but on top of one of the platforms there are seven fire-altars in a row. These rectangular altars were sunk into the floor, plastered with clay and contained a cylindrical and faceted clay stump and terracotta 'cakes' associated with ash and charcoal. There were a few bath-pavements and a well near these 'fire-altars', and there is little doubt that the southern unit was used for rituals. The buildings inside the northern unit suggest a residential purpose and it appears that the people associated with the performance of rituals in the southern unit lived in a specific enclosure, i.e. the northern unit, meant apparently only for them.

A 3 to 3.9 m wide mud-brick wall, which in its northern section was made in a box-like fashion with mud filling inside, enclosed the eastern mound (*c.* 360 × 240 m) which had a gate on the western side and an entrance at the north-western corner. The streets, of which five have been traced, are 1.8 to 7.2 m wide and were paved with terracotta nodules in the late phase and had occasionally street-fenders at the turnings. Most of the houses had fire-altars

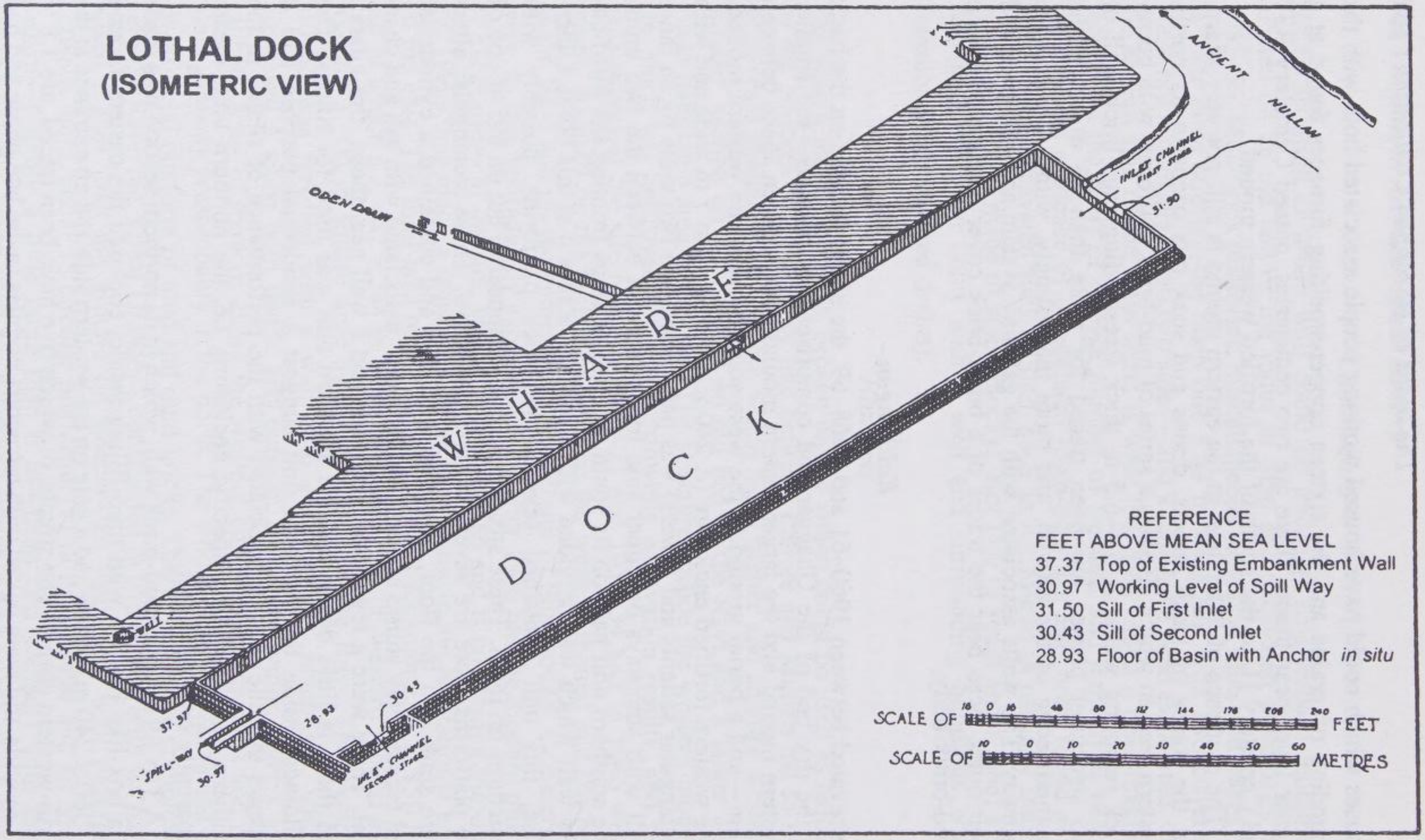



Fig. 18 Lothal dock (Rao, 1979)

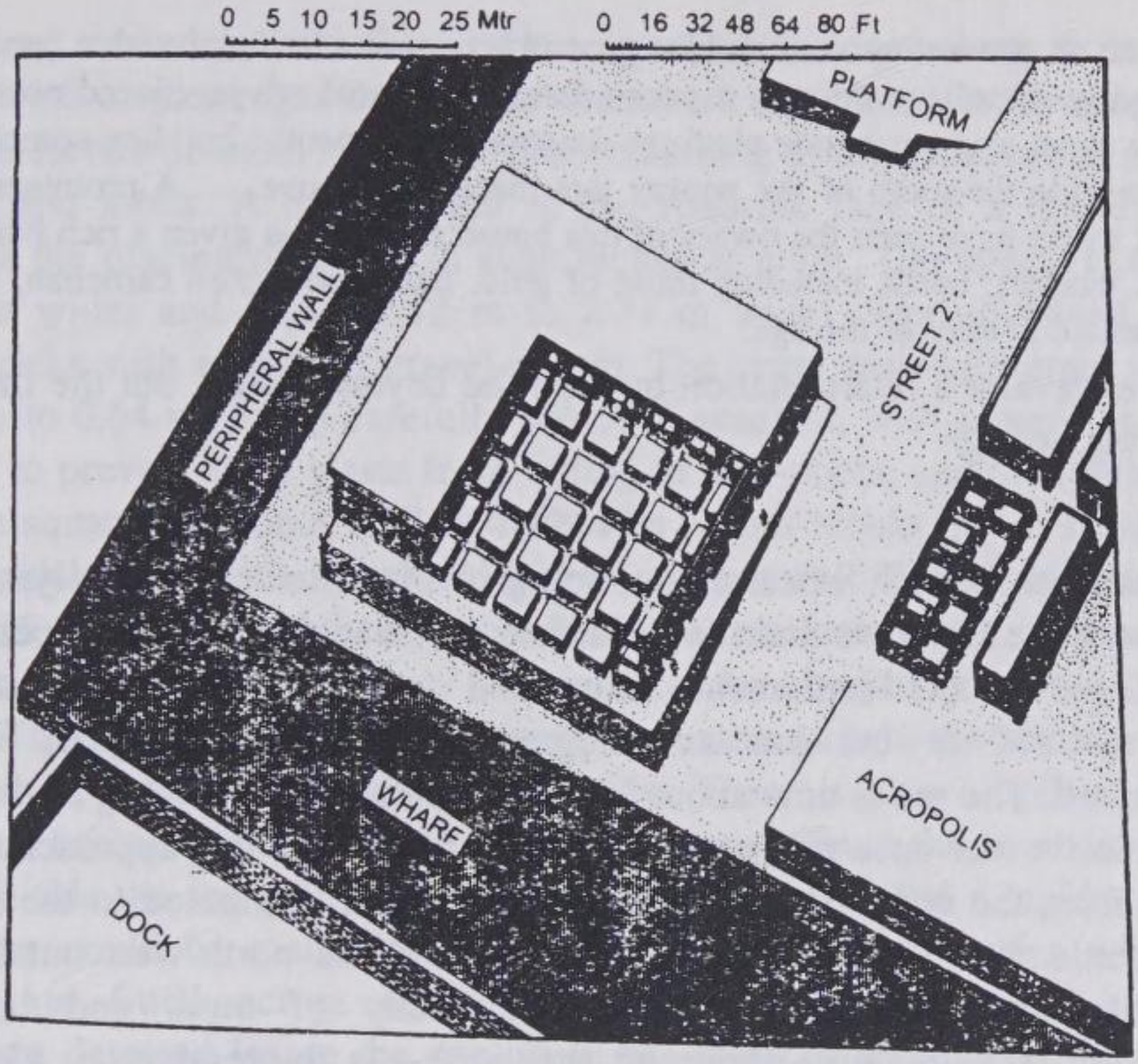



Fig. 19 Lothal warehouse complex (Rao, 1979)

of the type noticed in the western mound. In one case the entrance to the house was from a lane and there was a corridor from this entrance to a courtyard around which there were rooms of different dimensions (3 × 2 m, 2 × 1 m). There were 70–75 cm wide single-leaf doors. Oblong troughs made of mud-bricks in some courtyards may suggest the feeding of cattle, among other things. To the east of the eastern mound an isolated structure with five 'fire-altars' suggests a religious place.

### *Banawali*

Considerably upstream along the Ghaggar, not far from Hissar on the way to Sirsa, is Banawali (excavated in 1974–77 and 1983–84) which is a 300 × 150 m fortified site, with a part of it partitioned by a wall to form a 'citadel'. The plan is somewhat confusing but apparently irregular with a number of obliquely laid streets. A house in the town area (i.e. in the area outside the 'citadel') has been graphically described by the excavator R.S. Bisht (1982):

> It contained several rooms, probably a courtyard and a corridor, a large room having many earthen jars half embedded in the house floor, a sitting room paved with bricks, a worship room with a fire-place, and a kitchen with several hearths—

both on an elevated ground and the ground level—a toilet fitted with a wash-basin emptying its sullage through a pucca drain into a soakage jar placed outside the major street, and a roadside platform constructed against the building complex and just outside the room of the pottery jars mentioned above. . . . A prominent merchant might have been the owner of this house since it has given a rich harvest of seals, weights, beads including those of gold, lapis and etched carnelian, besides the deluxe pottery of the age.

The excavator's interpretation may not be beyond doubt, but the image is striking enough.

### *Lothal*

Located in the rich wheat-and-cotton-growing deltaic and low-lying area between the Bhogavo and the Sabarmati rivers in the Saurashtra peninsula of Gujarat, this settlement (excavated in 1955–62) measures only 240 m × 210 m but has an integrated and enclosed layout with a dockyard. The sea is now about 16–19 km away but according to the local tradition it was once much nearer and the place is in fact approachable by boat from the coast at certain times of the year. Compared to the size of the settlement which had a burial ground in the north-west outside the enclosed area, its peripheral wall—initially of mud, and later of mud-bricks with burnt-bricks on the north—is impressive: *c.* 13 m on the south and *c.* 22 m on the east, *c.* 1.8 m–2.4 m high on the south and *c.* 2.4 m high on the east. The entrance was on the south. There was no dividing wall inside, but in the southern section the mud and mud-brick platforms on which houses were built stood higher than such foundation platforms found elsewhere in the settlement and formed thus a more elevated area in this section. Three house-blocks with both exposed and covered drains, cess-pools and soakage jars have been excavated in this section. One of these house-blocks is supposed to have been a warehouse. It stands on a mud-brick podium (*c.* 49 m × *c.* 41 m × *c.* 4.1 m) with an outer platform, and had on it 12 solid blocks of mud-brick (each 3.65 m square and 0.91 m high) separated by *c.* 1 m wide criss-cross passages. As 65 terracotta sealings with impressions of reed, woven fibre, matting and even twisted cords have been found in this complex it is fair to imagine that it was 'a large warehouse wherein packages of goods were examined and stored'. Another house-block in this sector which has two streets, some lanes and two associated drains shows a row of 12 houses (each 7.62–8.53 m long and 5.48 m wide) with their bathing pavements at the back being connected with a drain outside. Outside this cluster of higher house-blocks, the main habitation area too is composed of house-blocks (sizes vary from 114.3 m × 22.86 m to 48.78 m × 41.14 m), although of a lesser elevation (from 1.21 m to 3.65 m). One house here has a wide

(12.19 m) verandah, with three rooms arranged in a row along its length. Bathrooms connected to the outside drains are a common feature, and so is the presence of small sacrificial pits containing terracotta cakes or round lumps and ashes. A niche found in the roadside face of a house may suggest the placing of lamps in such niches at night. The streets (3.65 to 5.48 m wide) and lanes (1.82 m to 2.74 m wide) were all paved with mud-bricks with a layer of gravel on top. The street drains (internal width 1.21 m to 0.64 m) had a carefully provided gradient, with screens at their mouth to prevent solid waste from falling in cess-pools, one of which was 1.31 m square and about 1.52 m deep. The Lothal 'dockyard' is a roughly trapezoidal area (western wall: 218.23 m, eastern wall: 215.03 m, southern wall: 35.66 m and northern wall: 37.49 m) enclosed by a four-course burnt-brick wall on the inner side of broader mud-brick embankment walls. There are two inlets to this enclosure, one each in the northern and southernmost portions of the eastern side. There is also a spill-channel which is basically a narrow burnt-brick-built passage at the southern arm. At high tide the sea-going vessels could enter the inlet and a regular level of water could be maintained by regulating it by means of a wooden sluice-gate fitted across the spill-channel. The presence of marine organism detected inside the enclosure has more or less proved that this was really a dockyard. A mud-brick platform (12.8 m wide and 243.84 m long) adjoining its western embankment possibly served as a 'wharf' for the loading and unloading of goods.

### *Surkotada*

The plan of Surkotada (excavated in 1971–72) is almost similar to the plan uncovered in the western mound of Kalibangan: a fortified complex with a clear walled division inside between the non-residential and residential parts. Before building the complex the ground level was raised by rammed mud deposit, about 1.5 m high in the non-residential section and 0.5 m high in the residential area. Thus, the non-residental section had a higher elevation than the residential one. The non-residential area measured 60 m square but the exact area of the residential part could not be determined. The 7 m wide fortification wall enclosing the non-residential area was made of mud and mud-brick, with a rubble cover on the outside and mud-plaster on the inside. Its eastern side was provided with a buttress of mud-brick with rubble cushioning at a later stage. The wall around the residential section was only 3.25 m wide. The main entrance to the non-residential section was in the south, with an opening to the residential section to its east. No inner structural complex is worthy of notice here. There is a burial ground to the north-west of the fortified enclosure.

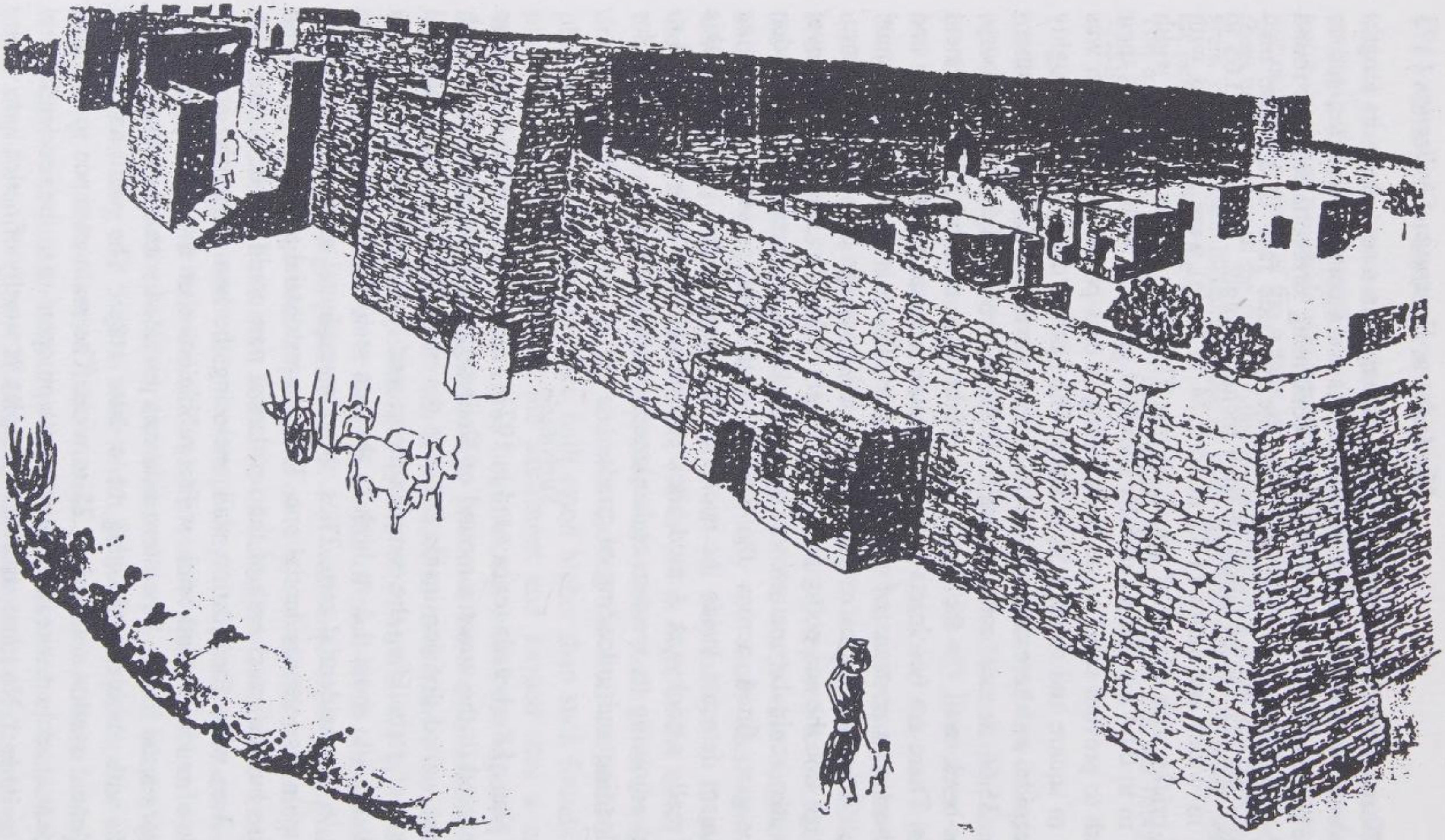


Fig. 20 General reconstruction of Surkotada Harappan settlement (Joshi, 1990)

### *Dholavira*

Excavations began at this 100 ha site (inclusive of the ruins outside the fortified area and a burial ground to the west) in an island or 'bet' of the Rann of Kutch in 1989–90 and have continued, with interruptions, till the present (1998). It lies in an area which receives less than 160 cm of annual rainfall, and has a history of prolonged droughts. Water management had to be an important feature of any ancient settlement in this area, and the fact that the Harappans were acutely aware of the problem is clear from the large (*c.* 7 m deep) rock-cut cisterns that have been reported virtually all around the inner side of the outer wall of the settlement. They also used the two local seasonal rivulets—the Mandsar (outside the walled area to its north–north-west) and the Manhar (flowing through the south-eastern part of the walled area)—by building dams across them. Within the area (*c.* 714 m × *c.* 614 m) enclosed by the outer wall (mud-brick with a veneer of stone-blocks on the outer face), which has not survived all around but is 8.40 m wide in its south-eastern section, there are at least three separately fortified enclosures: a small 'castle' area with a 'bailey' or a lower adjunct by its western side, and a much larger 'middle town' to the north of this twin complex. The area to the east has no separate fortification and is called the 'lower town'. A remarkably interesting feature of the plan is the presence of an open space of regular shape between the castle-bailey complex and the middle town. This has been thought to be a ceremonial ground. There were possibly two gateways on each side, of which two seem to have been excavated. From the brief reports published so far, it appears that the northern gate of the 'castle' which fronted the 'ceremonial ground' to its north was an elaborate complex: two chambers (separated by a passageway) set within the width of the fortification wall itself, and the landings and terraces associated with them. Both rounded and narrow-waisted polished stone pillar bases and parts have been found in this section. Thinner and straight monoliths with mushroom heads (1–2 m high) found standing amidst the complex of buildings to the east of the 'castle' are among many other briefly reported finds from this site. Streets, lanes, drains and houses have also been excavated.

An extensive and accomplished water management system gives Dholavira its unique place among the Indus civilization sites. This also shows that the modern climate of the area with its less than 160 cm of annual rainfall and frequent droughts was no different in the protohistoric context. It has been claimed that at least 16 water reservoirs were created within the city walls, covering 17 ha or 36 per cent of the walled area. Every effort was made to preserve rain water in an area where there is no

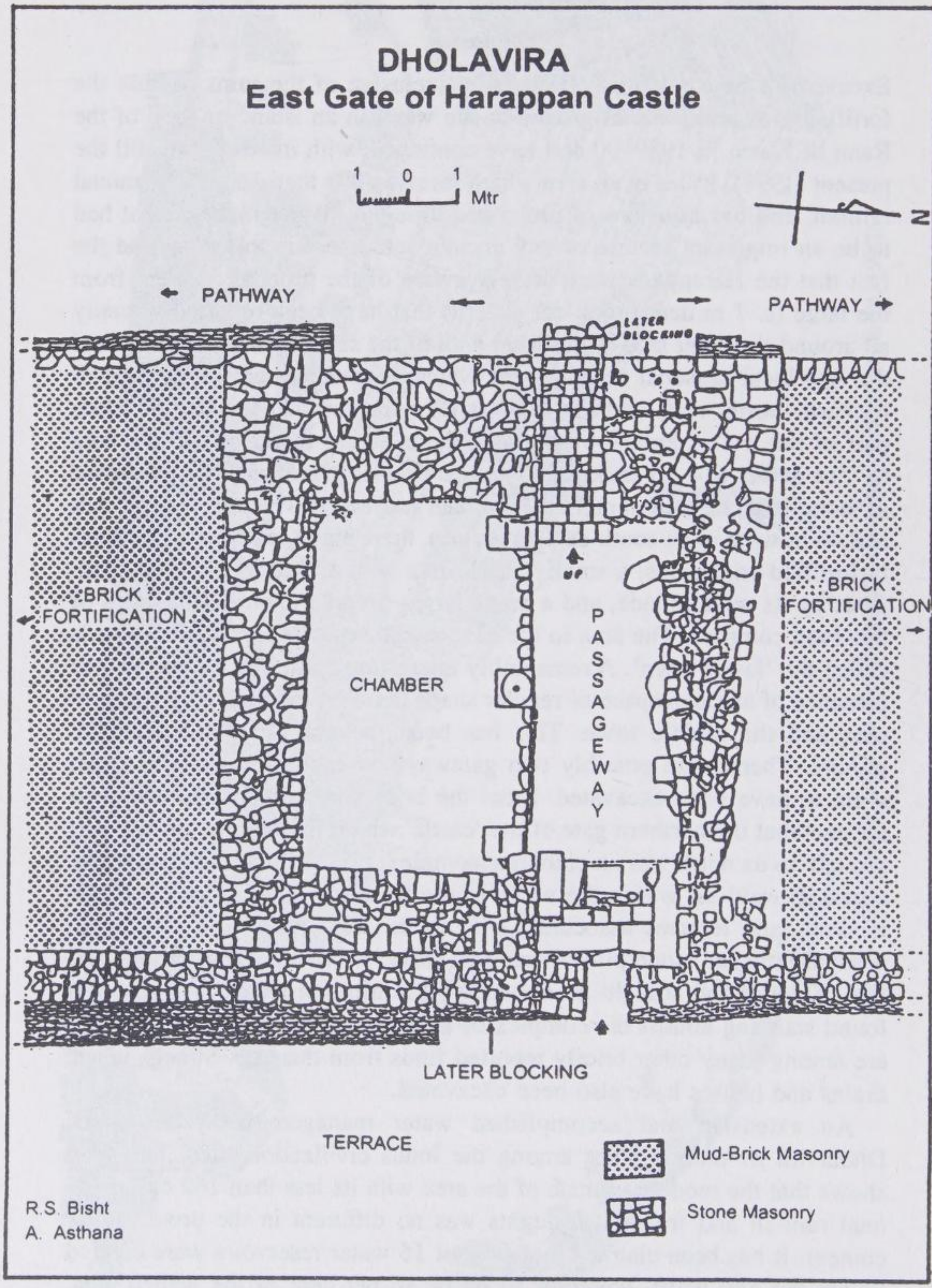



Fig. 21 East gate of Harappan 'castle', Dholavira (*Indian Arch.—A Rev.*)

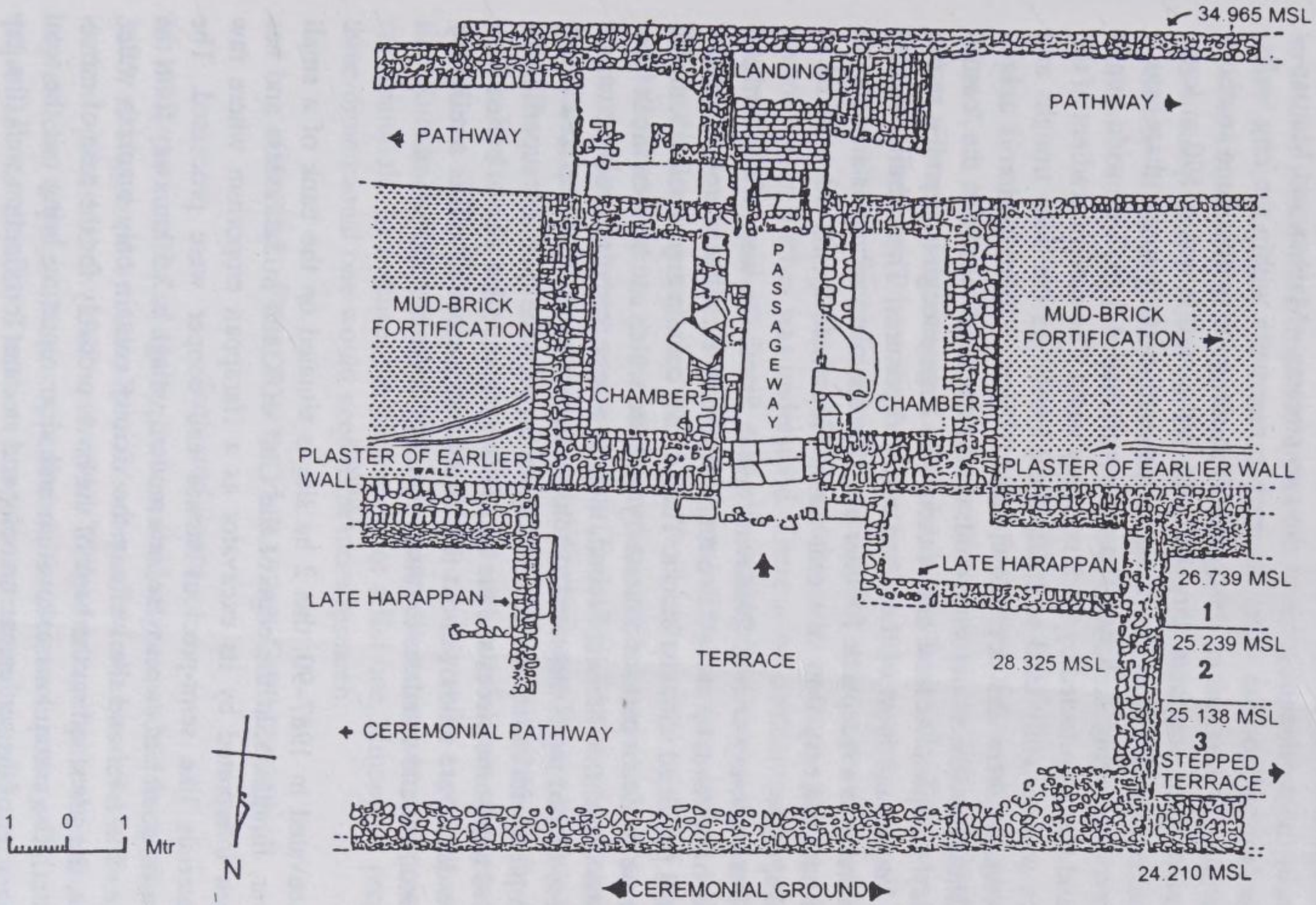



Fig. 22 North gate of the Harappan 'castle', Dholavira (*Indian Arch.—A Rev.*)

perennial source of surface water and ground water is largely brackish. The rains in the catchment areas of the two streams—Manhar and Mansar—were dammed and the water diverted to reservoirs within the city walls. The reservoir area was *c.* 750 by 70–80 m along the northern and southern margins of the peripheral city wall and in the west it was *c.* 590 m long, with a width of 170 m in places. In the south-eastern corner there was a reservoir covering *c.* 5 ha. The reservoirs had 4.5 to 7 m wide bunds around them, protected by brick masonry walls. The natural gradient of the place was certainly used to create these reservoirs but deep troughs and depressions were also dug into the rock. This rock-cut tradition is unique at Dholavira. Brick-and-stone-built drains occurred mostly in the 'castle-bailey' complex. At least one of them was large enough to permit a standing human and most of them had surface apertures. These drains carried rain water to a receptacle for later use. The apertures served as air ducts to facilitate the easy flow of storm water. Household drains were linked to soakage pits.

The cemetery area of Dholavira, which lies to the west of the fortified area, has thrown up at least two major surprises. First, there are rectangular burial pits lined with cist blocks. They do not contain any physical remains but are no doubt parts of a mortuary practice which can be seen much later in the megalithic burials. Second, there is a large, circular structure whose dome-shaped top is truncated to house the representation of a spoked wheel complete with its rim and hub. The space between the spokes is superficially filled with stone pieces and the hub portion has revealed a bowl buried in it. The details are unknown, but this circular structure represents a reliquary monument and antedates the stupa-building of the historic period.

### *Kuntasi*

Excavated in 1987–90, this 2 ha site is situated on the bank of a small river, Jhinjhoda, at the edge of the Gulf of Kutch in Saurashtra and has been interpreted by its excavator as a Harappan emporium where raw materials like semi-precious stones and copper were processed. The nearest source of sweet water is a modern village *c.* 2.5 km away from the site. The river and the wells in the vicinity contain only brackish water. Yet, the site stood on the bank of the river, probably for the ease of movement. The meticulous excavation and clear reporting bring out the total character of the settlement: an outer and an inner fortification wall (the gap between the two is uneven, 15–25 m), both made of boulders set in mud and both more than a metre in width. The watch-tower in the south-western corner (roughly 8.5 m × 10.55 m) is also of the same material and originally 10–12 m or more high. This overlooked the river. On the eastern side

the excavated gateway is complete with guard-rooms and passages. The structures inside were disposed around an open space fronted by a north–south stone platform (20.3 m × 3.8 m). Equally interesting is a multi-roomed structure which was found to contain kilns, furnaces, storage areas and a ramp going down to the river. The suggestion is that it was a workshop of pottery, beads and copper artefacts. Other fortified sites like Kuntasi occur in Gujarat, such as Pabumath, Desalpur, and Rojdi.

### *General Features of Harappan Settlements*[7]

Within the common elements of fortification, types of structures, organized layouts, etc. there is a fairly wide range of variations. For instance, Mohenjodaro, Harappa, Kalibangan, Lothal, Banawali, Surkotada, Dholavira and Kuntasi—the sites where the basic settlement type is clear—are all different in detail. Second, there is a complete grip over the technical details.The fort layout down to the watch-tower, bastions, gateways and possibly even ditches was understood. There is no confusion about water disposal (drains with gradients, cess-pits, soakage jars) and water management (dams across the Dholavira rivulets, wells in many places) either. Third, the housing materials were also well understood: bricks of standardized measurements, stones set in mud-mortar and large-scale stone cutting and polishing where necessary (cf. Dholavira). Fourth, all settlements were integrated into the landscape and their characters hardly depended on size. The variation in size between Mohenjodaro and Lothal, or for that matter, Kuntasi, is high, but they retain the common features of organized layout, etc. Fifth, functional variations too are only to be expected; some like Kuntasi could be dominantly mere outposts to procure and process raw materials. In essence, the picture is not a flat one, although a proper three-dimensional one would need a lot more research.

## General Features of Harappan Civilization

### *Seals and Script*

In 1998, the number of Harappan inscribed objects should be well past 3675, as suggested by Asko Parpola's corpus of Indian and Pakistani collections published in 1987 and 1991. They are mostly seals and seal impressions, copper tablets, copper/bronze implements, pottery and other miscellaneous objects. The last category comprises a good number of 'miniatures' in terracotta, stone, faience and other materials. According to a list published in 1977, about 50 per cent of these objects have been found at Mohenjodaro and when combined with the number from Harappa, the percentage goes up to 87 per cent. The other listed sites such as Chan-

Fig. 23 Harappan seals

hudaro, Kalibangan, Lothal, etc. are much smaller and much less exposed than Mohenjodaro and Harappa. In 1931, Ernest Mackay published 10 different types of seals at Mohenjodaro: cylindrical (?), square with perforated boss on reverse, square with no boss and frequently inscribed on both sides, rectangular without boss, button with linear designs, rectangular with perforated convex back, cube, round with perforated boss, rectangular with perforated boss, round with no boss and inscribed on both sides. It is the square/rectangular type which is the most common and thus forms the diagnostic type. Cylindrical seals are characteristic of the Mesopotamian and Persian world whereas the round type is diagnostic of the Gulf area. The presence of such types in limited quantities and often with Harappan motifs suggests a cultural interaction. The largest square seal of Mohenjodaro is a little more than 6.35 cm square. The more usual ones are around 2.54 cm square and examples of 1.27 cm square also are known. The seals are generally made of steatite but there are a few cases of silver, faience and calcite. Copper and soapstone specimens are known from Lothal. Most of the steatite specimens carry 'a glaze-like coating of a smooth glassy-looking substance'. The coating was possibly intended to cover the blemishes before the engraving was done, and afterwards baked in a kiln to 'whiten and improve the outside; for many of the broken seals show that the colour of the stone of which they were made was originally grey'. The number of actual seal impressions is much less than that of seals, and this, along with the fact that the seals are found abraded only at the edges and not inside, has led in certain quarters to the speculation that they were used more as amulets and/or identification marks than in administrative and economic life. The presence of one or two examples of 'amulets' had, in fact, been noted by Mackay at Mohenjodaro, where the interior of the seal had been carefully hollowed out to form a compartment which was 'formerly closed by a sliding cover that fitted with grooves cut in the two sides of the seal'. Mackay wrote:

> Personally, I am of the opinion that these seals were used almost exclusively for stamping sealings of clay, which, unless it were baked or of a special quality, would be unlikely to survive in a site that is, or has been, dump. . . . None of the seals of other ancient civilizations resemble those that have been found at Harappa and Mohenjodaro, either in their devices or the pictographs they bear, or even in shape.

The animals represented on the seals include the so-called unicorn (one-horned mythical animal), short-horned bull (in every case a low manger, flat-based and with concave sides, in front), buffalo (its nose sniffing the air), Brahmani bull (with its characteristic dewlap and hump), rhinoceros (a manger/cult object in front), tiger, horned tiger, elephant, horned elephant, fish-eating crocodile, antelopes, hare, etc. There are also

mythological motifs, composite animals and plant forms. There are grounds to believe that the seals were generally manufactured at the site where they have been found, with perhaps a limited quantity of better-fashioned specimens being left for groups of superior craftsmen and inter-site trade. At Mohenjodaro, seals, as Mackay pointed out, 'were found in the houses of the poor and rich alike', and at Mohenjodaro again, a limited study has led to the inference that there was a decrease in the number of seals and the variety of its icons and shape in the upper levels which witnessed an increase in the number of inscribed copper tablets.

Many attempts notwithstanding, the Harappan script is still undeciphered, and there is nothing to choose between the different linguistic hypotheses proposed in connection with the attempted decipherments. 'Scientific paradigms' of the Euro-American scholars (cf. Possehl 1996: 21) in this matter are no worse or better than the reasonings offered by Indian scholars. The basic signs are about 400 to 417, according to a concordance published by the Archaeological Survey of India. The calculation of sign frequency is remarkably interesting:

| | |
|---|---|
| over 800 occurrences: 1 sign; | over 50 occurrences: 46 signs; |
| over 200 occurrences: 6 signs; | over 20 occurrences: 86 signs; |
| over 100 occurrences: 24 signs; | over 10 occurrences: 100 signs. |

Apparently, only a small proportion of signs was regularly used and this suggests that our idea of the writing system as a whole is incomplete and that there could be a whole range of texts on perishable materials (cf. Possehl 1996: 63). That the Indus writing system may throw up surprises in future is amply indicated by the presence of an inscription of nine letters found on the floor of the western chamber of the north gate excavated at Dholavira: each letter is *c.* 37 cm high, *c.* 25–27 cm wide and 'made by arranging cut pieces of a milk-white crystalline material'. They were obviously affixed to a wooden or similar board and put up as a kind of 'hoarding'/'notice'. This shows that the extent of Harappan literacy may be much more than we are willing to admit on the basis of the inscribed material in non-perishable materials. With exceptions, the direction of writing was from right to left.

### *Pottery*

The categories of black-on-red, red, grey, buff and black-and-red (only in Gujarat) sum up the general types. In the painted varieties (only 10 per cent of the total pottery material at Kalibangan, which is broadly indicative

Fig. 24 Harappan pottery (a few shapes)

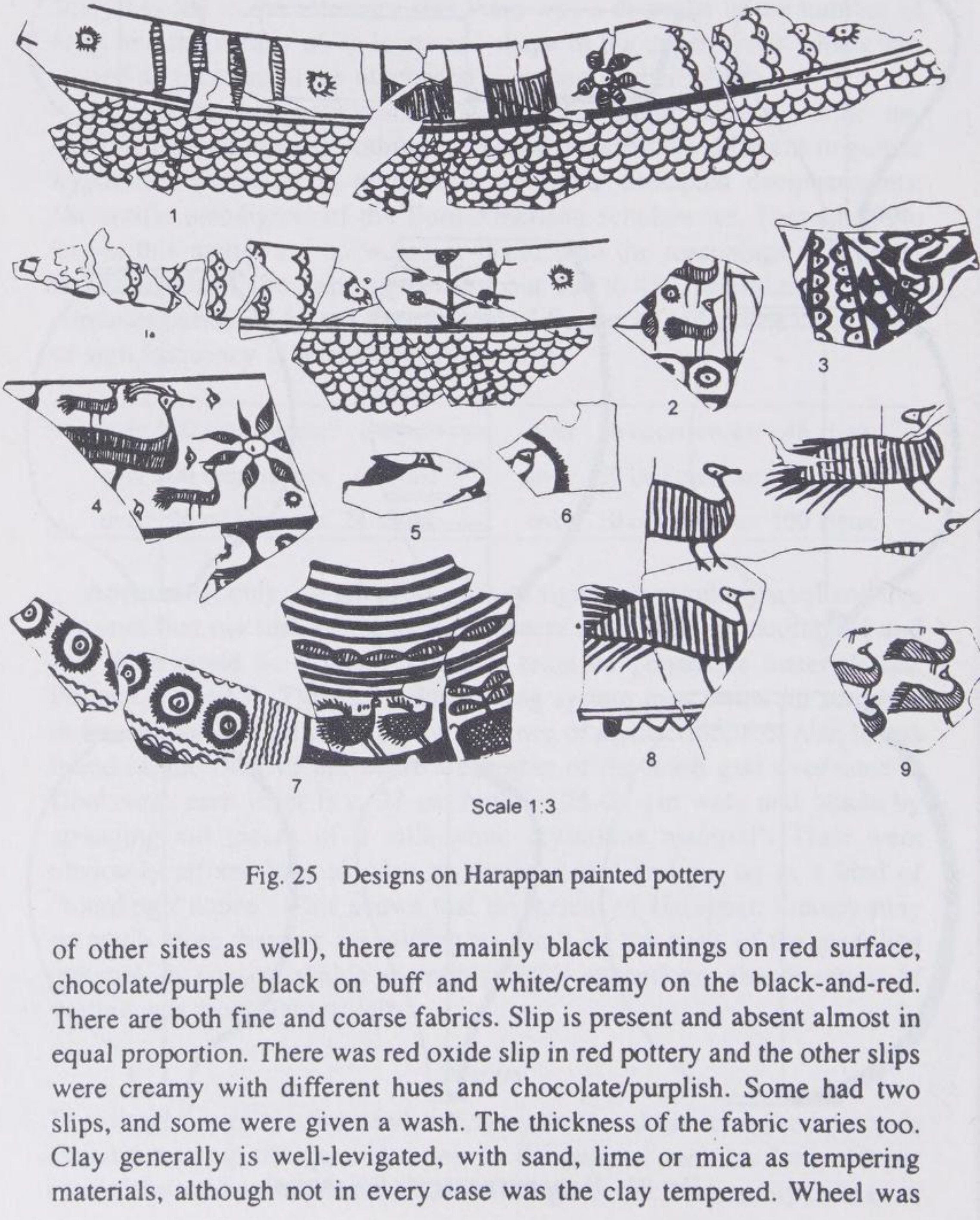



Fig. 25 Designs on Harappan painted pottery

of other sites as well), there are mainly black paintings on red surface, chocolate/purple black on buff and white/creamy on the black-and-red. There are both fine and coarse fabrics. Slip is present and absent almost in equal proportion. There was red oxide slip in red pottery and the other slips were creamy with different hues and chocolate/purplish. Some had two slips, and some were given a wash. The thickness of the fabric varies too. Clay generally is well-levigated, with sand, lime or mica as tempering materials, although not in every case was the clay tempered. Wheel was

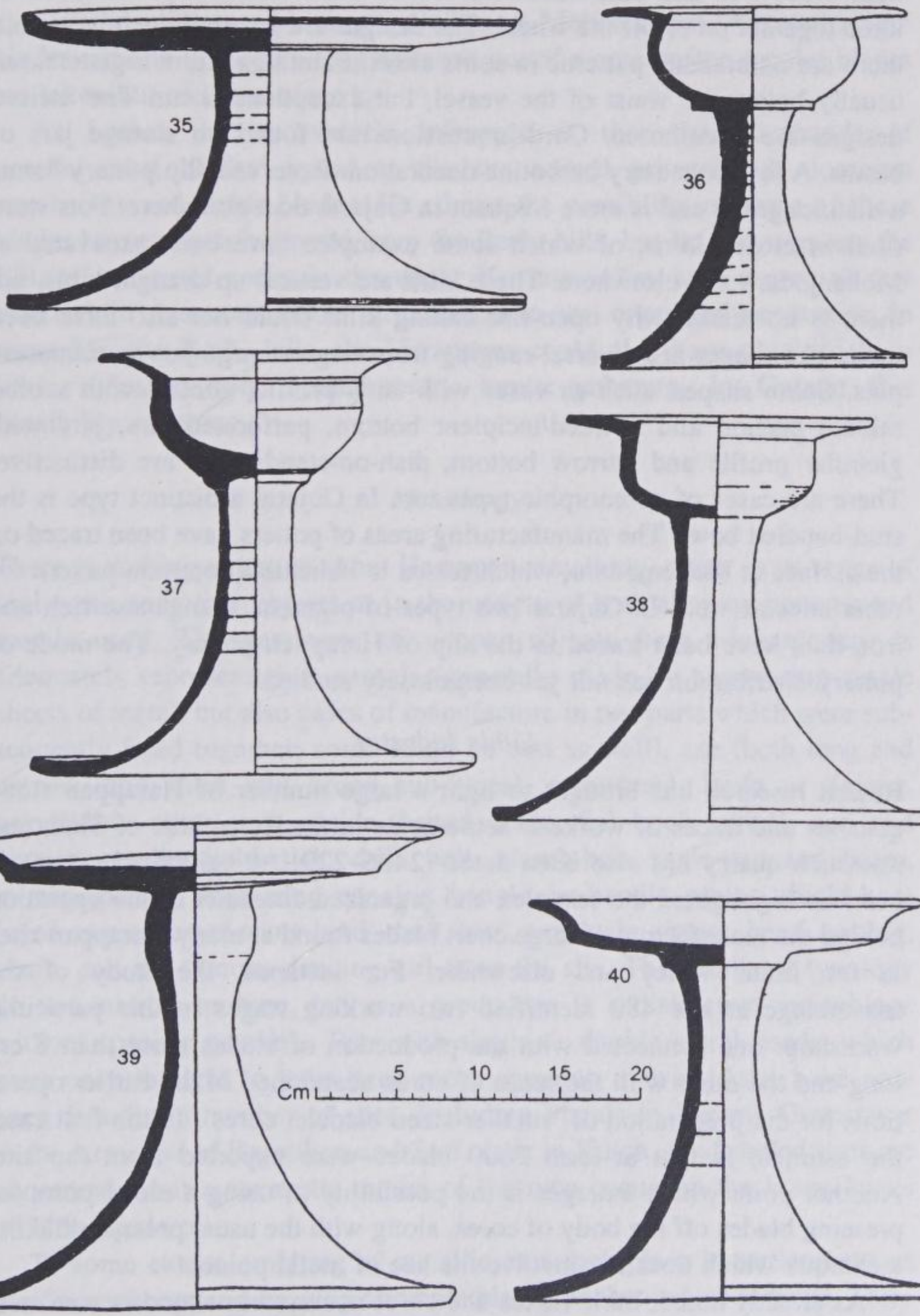



Fig. 26 Harappan dish-on-stand from Kalibangan (*Indian Arch.—A Rev.*)

used, possibly foot-wheel in Sind and Punjab and hand-operated wheel elsewhere. The threadmarks at the bottom indicate that the wheel rotated both clockwise and anti-clockwise. Some were made in parts and later luted together on or off the wheel. The designs are generally geometric but there are naturalistic patterns in some cases. Paintings are in registers, not usually below the waist of the vessel, but exceptions occur. The incised designs are uncommon. Cord-impressions are found on storage jars or basins. A few pots carry barbotine decoration. Reserved-slip pottery forms a distinct group and is more frequent in Gujarat than elsewhere. Pots were fired in closed kilns, of which some examples have been excavated at Mohenjodaro and elsewhere. These kilns are vertical up-draught kilns, but there is no reason why open-fire baking kilns could not also have been used. The shapes are diverse, ranging from large storage jars to miniature pots. Some shapes, such as vases with an S profile, goblets with scored middle portion and pointed/incipient bottom, perforated jars, jars with globular profile and narrow bottom, dish-on-stands, etc. are distinctive. There are cases of zoomorphic types too. In Gujarat a distinct type is the stud-handled bowl. The manufacturing areas of potters have been traced on the surface at Mohenjodaro, which seems to indicate a common pattern for other sites as well. In Gujarat two types of pigment, manganese-rich and iron-rich, have been traced in the slip of Harappan pottery. The mode of pottery distribution has not yet been closely studied.

### *Lithic Industry*

Recent research has brought to light a large number of Harappan stone quarries and traces of workers' settlements in the Rorhi hills of Sind, and one such quarry has also been dated (2466–2201 BC calibrated range). It has also highlighted the complex and organized character of the operation behind the manufacture of large chert blades found at many Harappan sites in the Indus valley and elsewhere. For instance, the study of the assemblage at site 480 identified two working stages in this particular workshop: one connected with the production of blades more than 8 cm long and the other with the reuse of cores abandoned in the earlier operations for the preparation of 'smaller-sized bladelet cores'. In the first case, the estimate is that at least 2000 blades were exported from the site. Another point which emerges is the possibility of using a metal point for pressing blades off the body of cores, along with the usual pressure-flaking technique which does not involve the use of metal points.

As already noted, lithic flakes and cores occurred in abundance in most of the houses of Mohenjodaro, and in this context it is logical to surmise that at least secondary preparations for specific blade-based tools took

place in individual households, including some blade-production. Cherts, not brought from the Rorhi hills, were also used at Harappan sites, and in such cases the blades are smaller. There is also proof of the presence of a specialized miniature-blade preparation at Mohenjodaro. 'Crested ridge' blades, i.e. the blade-like lengths taken out of a core before regular blades are taken out of them occur too.

At Lothal the excavator's inference is that the 'thousands of parallel-sided blades' found at the site served primarily as domestic pen-knives and sickle-blades. He admits the possibility of some of these blades having been imported from the Rorhi hills, but he also suggests the Kaladgi series of rocks in the upper Krishna valley as a source of raw material in this connection. In addition to the organized production in areas like the Rorhi hills, the Harappans could also have obtained their lithic industry from contemporary hunter-gatherers. In Gujarat this possibility is strong.

### *Metallurgy*

There is nothing tentative about Harappan metallurgy either in its range of tool types and other objects or in the variety of both alloying patterns and metals used. The catalogue of copper objects from Mohenjodaro is adequately representative: vessels (generally made by hammering single sheets of metal, but also cases of manufacture in two parts which were subsequently luted together; some could be cast as well), axe (both long and narrow, and short and broad sub-types), arrowhead, knife or dagger, sword/dirk, razor, saw, sickle-shaped blade, fish-hook, chisel, awl and reamer, needle, kohl-stick, drill, bolt, plumb-bob, scale-pan and beam, mirror, spatula, finger-ring, ear-ring, bangle, jar-handle, piping, shield-boss (used as patches of some kind), bull, bird, terminals, spacer, bead, casting, chain, and the famous dancing girl from the site. The details of typology do not interest us here, but as a group this is a distinctive assemblage without specific parallels. Pins with single or double spiral heads, which were once thought to have been more common in west Asia, have now been found at a number of sites, including Manda in Jammu, Ganeshwar in the Aravallis of Rajasthan and Surkotada in Kutch. Shaft-holed axes are uncommon, but a terracotta model of the type occurs in the lower levels of Mohenjodaro.

To some extent, smelting of metallic ores took place in settlements, as the finds of copper ores, slag and crucibles at Mohenjodaro indicate. More commonly, they were perhaps smelted near the pit-heads. The alloying pattern is as follows:

TABLE V.1
Harappan Alloying Pattern
(after Chakrabarti and Lahiri, 1996)

| | Moh. | Hp. | Chan. | Rngp | Lthl | Sktd | Ngwd/ Almgp | Klbn | Total |
|---|---|---|---|---|---|---|---|---|---|
| Pure copper | 95 | 5 | 13 | 5 | 51 | 13 | — | 2 | 184 |
| Tin (Sn) | 29 | 7 | 7 | 5 | 10 | 6 | — | 3 | 67 |
| Arsenic (As) | 2 | 2 | 6 | — | — | 6 | 2 | 1 | 19 |
| Lead (Pb) | 3 | — | 1 | — | 4 | 6 | — | 1 | 15 |
| Nickel (Ni) | 4 | — | — | 1 | 5 | — | — | — | 10 |
| Sn + As | 4 | 1 | 2 | — | — | 1 | — | — | 8 |
| Sn + Pb | 3 | — | — | — | — | 6 | 1 | — | 10 |
| As + Pb | 1 | 2 | — | — | — | 2 | — | 1 | 6 |
| Sn + Ni | — | — | — | 2 | — | — | — | — | 2 |
| Pb + Ni | — | — | — | — | 1 | — | — | — | 1 |
| Zinc (Zn) | — | — | — | — | 2 | — | — | — | 2 |
| Total | 141 | 17 | 29 | 73 | 73 | 40 | 3 | 8 | 324 |

Note: Ngwd = Nagwada in Gujarat; Almgp = Alamgirpur in UP.

The variety of alloys is distinctive and so is the emphasis on a pure copper tradition which, according to Indian tradition, is ritually pure. Copper must have come primarily from the Aravallis in Rajasthan and Gujarat which could also supply other metals, including zinc and lead ores mixed with silver. Another major source was the rich copper deposits of Baluchistan and presumably Afghanistan. The nearest source of tin is the Tosam area of modern Haryana, although some tin could also have come from north Afghanistan and central Asia. Gold, of which there is a substantive amount of jewellery from Mohenjodaro and other sites, could have been obtained by panning river sands for gold, or they could have come from the auriferous deposits of Andhra and Karnataka. Arsenic was obtained from lollingite ores, some amount of which has been obtained at Mohenjodaro. Zinc ores occur in abundance in Rajasthan. Two Lothal objects contain 39.1 per cent and 66.1 per cent iron and the latter can be called an iron object (a fragment in this case). Some familiarity with iron-smelting may be assumed, at least in the case of the Gujarat Harappans. As small bird and animal figures in copper and the figurine of the dancing girl indicate, the lost-wax process of making metal objects was widely practised.

### *Miscellaneous Arts and Crafts*

Ordinary household items like saddle querns, mullers, pounders, bowls, etc. must have had a separate group of craftsmen just as there are such

groups even today. The processing of semi-precious stones—agate, carnelian, onyx, jasper, plasma, crystal and others—was done by bead-makers who had their own workshops. At the bead-making factory excavated at Lothal nearly 800 finished and unfinished beads were found, along with the evidence of a kiln which used thin burnt-brick walls with mud-plaster and was ovoid in plan (*c.* 1 m high and *c.* 1.5 m long) with four interconnected flues in the lower chamber so that fire could touch the earthen bowls containing pebbles and beads. Because of the continuity of bead-making industry in the modern times, it has been possible to get a good idea of how beads of semi-precious stones were manufactured, right from the collection of stone nodules to the final polishing. Etched designs were put on some carnelian beads by first immersing the designed beads in a plant-derived alkaline substance and then heating them for the absorption of the alkali by stone. Some beads like the long barrel-cylinder beads in translucent red carnelian or those made of moss agate were possibly considered very precious because one would require a large quantity of raw material to make them. Micro-beads made of steatite paste which was made hard by heating are a distinct Harappan feature, and so are the beads made of faience which is obtained by amalgamating lime with quartz at high temperature. Conch-shells were widely used for bangles, etc. just as they are used now. Ivory was used generally for beads and gamesmen, and although bone was used for beads, its more common use was for making awls and pins. Varieties of gold and silver jewellery and silver vessels, especially from Mohenjodaro, Harappa and Lothal, indicate the emphasis placed on these precious metals. The main types of gold ornaments comprised bracelets, necklaces, armlets, pendants, ear-studs, beads, bosses, brooches and fillets. Direct evidence of cotton has not survived except as impressions. Evidence has also been obtained of the firing of a class of terracotta bangles (called stoneware bangles) at high temperature.

### *Weights and Linear Measures*

A.S. Hemmy's observation on the identical weights found at Mohenjodaro and Harappa are worth quoting:

> These weights are with hardly an exception uniform in shape, a rectangular block, cubical in the smaller sizes, and in the great majority of cases of the same material—a hard chert. They are well finished polished faces and occasionally with bevelled edges. They are made with much greater accuracy and consistency than those of Susa and Iraq. The system is binary in the smaller weights and then decimal, the succession of weights being in the ratios 1, 2, 1/3 × 8, 4, 16, 32, 64, 160, 200, 320, 640, 1600.[8]

A shell object from Lothal has been interpreted to be a compass for measuring angles, but perhaps more convincing is the evidence of a broken

piece of 'scale' made of shell from Mohenjodaro: 1.57 cm wide, 5.29 cm long and 0.67 cm thick.

The dividing lines are cut with a fine tool into subgroups of 5 divisions marked with a dot and circle, also suggesting the use of the decimal scale between any *two* dots or circles. . . . The estimated distance between the dot and the circles is believed to be 33.53 mm. This distance was termed 'The Indus Inch' when the British ruled India and inch was 1/36th part of the legal linear unit of length—yard.[9]

## *Crops and Domestic Animals*[10]

In an area spreading from Baluchistan to the upper Ganga-Yamuna Doab and from Jammu to Gujarat there has to be a strong diversity of agricultural practices and animal husbandry. There is no reason why it should be any different in the Harappan context, especially when there is no firm evidence of climatic change since then. The presence of irrigation and plough can both be taken for granted. We have argued strongly in favour of the presence of irrigation in an earlier section, and the find of an early Harappan ploughed field at Kalibangan and a terracotta model of a plough at Banawali are conclusive as far as the idea of plough agriculture is concerned.

TABLE V.2

*Site-wise Distribution of Crop and Plant Remains at Some Harappan Sites*

| | |
|---|---|
| *Mohenjodaro* | wheat, barley |
| *Chanhudaro* | wheat, barley, mustard |
| *Harappa* | wheat, barley, peas (Pisum arvense), sesame (*Sesamum indicum*), rice, and millets |
| *Banawali* | basically unpublished, but wheat reported |
| *Kalibangan* | wheat, barley, chick-pea (*Cicer arietinum*), pea (*Pisum arvense*) |
| *Rohira* (district Sangrur, Indian Punjab) | early Harappan context—modern babul (*Acacia*), kareel (*Capparis aphylla*), jhau (*Tamarix dioica*), teak (*Tectona grandis*), toon (*Cedrella toona*), khirani (*Manilkara hexandra*), and deodar (*Cedrus deodara*) woods; modern henna or mehendi (*Lawsonia inermis*) and grape-vine (*Vinus vitifera*); mature Harappan context—in addition to babul and jhau trees and grape, khejri (*Prosopis spicigera*) and sheesham (*Dalbergia sp.*) woods, 'ber' (*Zizyphus jujube*) and 'harsingar'/'shephalika' flower |
| *Mahorana* (district Sangrur, Indian Punjab) | in addition to some of the things found at Rohira, an important find is hyacinth bean (*Dolichos lablab*) which needs 'frequent irrigation' |

| | |
|---|---|
| *Hulas* (Saharanpur district, UP Doab) | wheat, barley, wild (*Oryza rupifogon*) and cultivated (*Oryza sativa*) rice as impressions on potsherds, sorghum and ragi millets, cotton, castor, almond, walnut and a variety of pulses including *Dolichos biflorus, Pisum arvense, Pisum sativum, Lathyrus sativas, Vigna radiatus, and Vigna mungo* |
| *Lothal* | babul, siris (*Albizzia sp.*), teak (*Tectona grandis*), haldu *(Adina cordifolia*) and rohini (*Soymida febrifuga*) woods; rice (identified with certainty in the Lothal report), and possibly millet and sesame |
| *Surkotada* | mainly Italian millet (*Setaria Italica*) and ragi millet (*Eleusine coracana*), in addition to a large variety of wild grass and plant species |
| *Shikarpur* (Kutch) | wheat, ragi millet and Italian millet in addition to woods inclusive of silk-cotton (*Salmalia malabarica*) and sal (*Shorea robusta*) |
| *Rojdi* | a variety of millets inclusive of ragi, Italian and sorghum millets and a variety of wild grasses and plants, some of which can be used as fodder |
| *Kuntasi* | wheat, barley, a variety of millets including Panicum, Italian and Kodo millets, and Job's tears, the seeds of which were probably used for beads |
| *Shortughai* | barley, wheat, *Panicum* millet, lentil, pea, almond, pistachio, grapes and linseed. |

The list is by no means comprehensive and does not discuss the technicalities involved, but it offers a rounded picture of the variety of crops available to the Harappans. On the basis of the early occurrence of millets in the Gujarat sites and of Panicum millet in the early level of Shortughai, there is no reason to believe that they were introduced late in the Harappan sequence or served the purpose of a 'green revolution' crop. Also, millets were an integral part of the Sind sites as they were in pre-industrial modern Sind, although no direct evidence has yet emerged. All the major crops of the subcontinent were known along with a variety of pulses. The trees inclusive of deodar, teak, sheesam, sal and babul suggest a landscape with which we are familiar, and if a particular tree is missing now in a particular area, that may simply be due to the denudation of the landscape by humans. Grapes were known and so were henna or mehendi and the harsingar or shephalika flower. As noted earlier, cotton was cultivated too.

Domestic animals comprised cattle, buffalo, sheep, goat, pig, camel, elephant, dog, cat, horse and others. One may include ass in this list. Horse occurs at Harappa, Mohenjodaro, Lothal, Surkotada, Kalibangan and Kuntasi and has been identified as such by many scholars with expertise

in animal identification. There are wild varieties of sheep, goat and possibly ass and pig, and a number of deer varieties. There are also turtles and fish, and one of the most significant recent hypotheses in this field is that dried sea fish from possibly the Makran coast used to be traded as far upstream as Harappa. The culling of cattle herd surplus was practised, as the pronounced cluster of cattle deaths between the two and five years of age at Oriyo Timbo in Gujarat suggests. A recent study suggests an organized exploitation of molluscs for food, at least in Gujarat.

### *Trade*[11]

The explicit evidence of Harappan internal trade is the occurrence of various raw materials found at Harappan sites in different regions. In the context of Gujarat alone the sitewise distribution of raw materials (prepared before Dholavira excavations) includes steatite, shell, carnelian, jasper, gold, amazonite, quartz, onyx, sardonyx, flint/chert, chalcedony, hornblende, syenite, silver, alabaster, ivory, agate, lapis lazuli, crystal, bloodstone, opal, plasma, sandstone, granite, schist, felspar, dolerite and copper/bronze—28 items. The sheer fact of their being found at different Gujarat sites makes the economic world behind it—a world of raw material procurement, processing, manufacture of objects and their distribution—obvious. Gujarat is only one area of Harappan distribution; if all the areas are taken together, this world assumes great proportions.

(1) Emanating from the Karachi region, one line of movement went through Kohistan and, following broadly the western banks of the Indus river, reached the Larkana district where Mohenjodaro was located. From Larkana, the Indus was crossed to reach Chanhudaro and the eastern segment of Sind. (2) There was also a route which passed from the Sukkur/Rorhi hills to Harappa on the one hand and the Ghaggar/Hakra stretch on the other. (3) That the Indus river was also used for some amount of traffic is a distinct possibility, although this was not the sole route in the Sind region.

Sind and Baluchistan seem to have been interacting both over land and along the coast with Gujarat. (1) The eastern segment of Sind . . . mediated a route between the Sind plains and Gujarat through Kutch and Kathiawar. (2) A sea route, hugging the coast. . . . also appeared. . . .

Land and riverine routes connected the Bahawalpur and central Indus region with Rajasthan. (1) One land route went from the Multan-Montgomery region to Bahawalpur, from where the Anupgarh-Lunkaranser-Bikaner-Jhunjhunu axis was traversed. (2) An important link was the Multan–Pugal–Bikaner route. (3) There was also a land route from Ganeshwar to Sothi–Bhadra via Neem-Ka-Thana and Khetri. (4) That the Kantli river was mediating traffic between Rajasthan and the regions to its north and west as well is likely. . . .

Between Sind and east Punjab, there were two major routes that passed through the Bahawalpur region. From there, (1) one branched off to the Upper Sutlej region,

going through Bhatinda and Ludhiana districts till the edge of the Himalayas where Manda was located. (2) The other, after passing the Ghaggar–Drishadvati divide of central Punjab, went to Hissar and Jind, reaching Rohtak from where one branch crossed the Yamuna to Meerut and the other proceeded to Gurgaon.

East Punjab also shared a very close interaction with Rajasthan. . . . (1) A branch of the Kantli river, which is now extinct, acted as a channel between the Sikar district and Hissar. (2) Another river, the Dohan, . . . also went to Haryana. (3) The land route went from Ganeshwar through Rajgarh from where one branch went to Bhiwani . . . and the other reached the Sothi–Bhadra region.

The foregoing summation of major internal routes linking the different areas of the Harappan civilization, which is based on a careful study of the distribution of various raw materials at different sites and their possible sources, highlights more than anything else the scale and importance of Harappan internal trade. The evidence of Harappan external trade has been found principally in north Afghanistan, Turkmenistan, north and south Iran, the islands of Bahrain, Failaka and the Oman peninsula in the Gulf, and north and south Mesopotamia. There are finds of 'Indus' or 'Indus'-related objects in all these areas. Similarly, there are non-Indus, externally derived objects in the distribution area of the Indus civilization. All these objects can immediately be put in different categories. The most explicit items are two types of 'Indus' beads—etched carnelian and long barrel-cylinder carnelian types—and square/rectangular Indus seals with script or the presence of Indus script on pottery. They occur in virtually all areas. Along with this are less direct items, such as pottery, 'Indus' motif on local seals, objects of ivory, miscellaneous terracottas, etc. all of which suggest a familiarity with the 'Indus' area. On the other hand, within the 'Indus' area there are some seals of external affinity, steatite/chlorite vessels with specific designs, some externally derived motifs, etc. The details of the typology and context of all these objects and motifs have drawn much discussion. Such details are not necessary in the present context, but a few general observations may be made. Everywhere outside the subcontinent the relevant finds are found along well-defined trade routes. For instance, to reach Shortughai in north Afghanistan the traders had to be familiar with the orientation of the different passes across the Hindukush. In Iran the Baluchistan–Kirman–Fars plain–Luristan–Khujestan route of south Iran and the northern Iranian route through Kandahar, Girishk, Herat (these three places in Afghanistan), Meshed (north-east Iran), Hissar (north Iran) and beyond along the southern slope of the Elburz range were both used. These routes were overland routes to Mesopotamia. Turkmenistan was reached either via the Shortughai and Herat areas or across the Kopet Dagh range from Meshed. The southern Iranian route also offered access to the Gulf, but the Gulf area could be reached by sea, and thus there was a maritime access to Mesopotamia as

well. The maritime route could have touched the Makran coast, but more logically, ships went out of Gujarat to the Oman peninsula taking the help of monsoon winds. This is an area where the 'Indus' presence is sharply visible, down to pottery and the presence of 'Indus' designs on presumably some local pottery. Ras-al-Junayj on the Oman coast lies in an area which provides the landfall for ships coming from the Gujarat side, and significantly, the place has yielded indisputable 'Indus' artefacts. In the 'Indus' area, cylinder seals of the Mesopotamian, Iranian and central Asian world occur notably at Mohenjodaro and Kalibangan but show 'Indus' motifs. A 'Gulf' seal was found on the surface at Lothal and a seal with a 'Gulf' motif has been found at Bet Dwaraka. On the other hand, several 'round' seals of Gulf origin bear Indus motifs and script not merely in the Gulf itself but also in Mesopotamian sites like Ur and the Iranian Khujestan site of Susa. By and large, the whole region seems to be tied by a network of both overland and maritime trade. This conforms to a pattern with which we are familiar in much later historical contexts, and it may not be wise to read too much in this trade, as several scholars have done. For instance, the term 'Meluhha', which occurs in Mesopotamian literature, may not denote exclusively the area of the Harappan civilization, as some scholars have hypothesized. A better explanation is that the term could denote the whole area to the east of Khujestan and its adjacent area in Iran and thus possibly included the 'Indus' area as well in its scope. There could also be settlements of Harappan traders in Mesopotamian cities; there have been settlements of Indian traders in the entire region from central Asia to the Gulf in the historic periods including the present.

Goods must have been regularly traded over this whole area, and it is possible that in this process, especially in the context of the Oxus-Indus interaction zone, the seasonal nomads of the Hindukush region like the modern Powindahs played a role. In the scheme of Harappan external trade, north Afghanistan like the Gulf region seems to have had a special niche. Miscellaneous Harappan or Harappa-related objects have been found in various looted graves of the Bactrian region and at a site called Dasly. On the other hand, indisputably rich trade goods with Bactrian material have been found in Quetta, Mehrgarh and Sibri, all in the Bolan pass region. These finds, according to some scholars, belong to the end phase of the Indus civilization, but there is really no special reason why it cannot date from its mature phase.

## *Religion*[12]

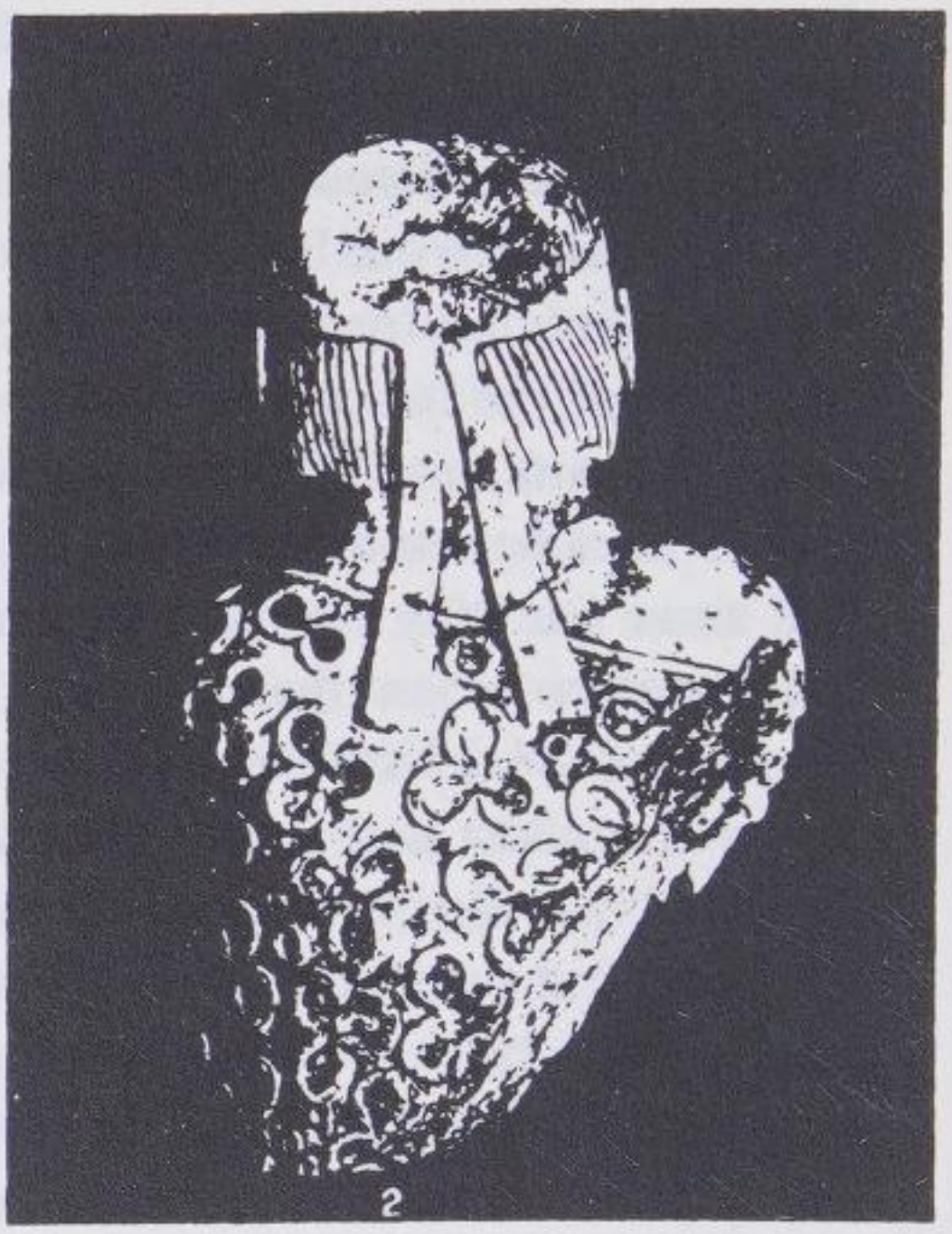
The archaeological evidence of an 'Indus' religion was comprehensively discussed in the first volume of the Mohenjodaro report in 1931, and

although many scholars have expressed disagreement with it, the disagreements are basically in the matter of detail and do not really affect the basic structure offered. In view of the female terracotta figurines found at sites, a belief in the different types of mother goddess may be taken for granted. A small sealing from Harappa shows a plant coming out of the womb of a woman. Another representation on a seal has been interpreted as 'a prototype of the historic Siva'. An apparently three-faced god with horned head-dress sits on a low Indian throne in a yogic posture, with legs joined heel to heel below him and the arms resting on the knees on either side. The arms are fully covered by bracelets, three on each arm being larger and more prominent than the rest. The chest is covered by a row of necklaces disposed in the form of an inverted triangle. There are two bands across the waist and it looks as though the figure is shown ithyphallic. There is an ibex/deer/goat below the throne. A number of animals (elephant and tiger on the left and a rhino and a horned bull/buffalo on the right) and an inscription occur as a background. The horned head-dress, association with animals, three faces, ithyphallic state and the yogic posture mark it out as a deity who has a better chance to have been a prototype of Siva than anything else. 'Siva' is also writ large on the phallic stones found at Mohenjodaro and Harappa where there are also ring-stones on the model of female signs. Further, a standing nude figure in a tree with a supplicant below suggests a tree deity, and another seal shows a row of seven standing females, recalling the 'seven mothers' of the later Hindu tradition. The life-like rendering of animals shown on seals may denote some sanctity associated with these animals. At Kalibangan, the offering-pits found on the top of platforms in the western mound and the offering-pits found in the ordinary dwelling places of Lothal, Banawali, etc. show a pattern of sacrifice which many practising Hindus will recognize. We do not suggest that Hinduism, as we find it today, was there in the Indus civilization. All that we would say is that some later features of Hinduism have been echoed by 'Indus' finds, and thus this civilization is likely to have contributed to the stream of 'sanatana dharma' or traditional religion of the modern Hindus.

### *Sculptural Art*[13]

The number of stone and bronze sculptures is limited, although on the whole there is some justification for claiming a multiplicity of art styles and postulating the roots of the much later historic art of the subcontinent in them. This art form is a product of the Indus civilization itself; its roots cannot be traced in the pre-'Indus' period which yields only stylized terracotta female and animal figures. The major specimens of Indus sculpture

1


2


3


4

Fig. 27 'Sramana' figure from Mohenjodaro

in stone are: (1) a head from Mohenjodaro, i.e. the famous *Sramana* head (the surviving portion is 17.78 cm); (2) a headless figure seated in a meditative posture (41.91 cm), also from Mohenjodaro; (3) the torso of a male from Harappa (about 10 cm high, as preserved); (4) the torso suggesting a dance posture from Harappa (about 10 cm high, as preserved); (5) a seated ibex/ram (49 cm long, 27 cm high and 21 cm wide), unprovenanced but certainly of the Indus civilization; (6) a broken, seated male figure from Dholavira (height unpublished). In addition, there are a few miscellaneous, severely mutilated 'heads' and 'seated figures' from Mohenjodaro. In bronze there is only the figure of a dancing girl from Mohenjodaro (11.25 cm high). There are certainly bronze objects from various sites, but they cannot be put in the category of high art. The *Sramana* head, with its eyes half-closed and focused on the tip of the nose, the shawl across the chest and below the right arm and the trefoil design of the shawl, leaves no doubt that here we are faced with the representation of a sacred person. The seated Mohenjodaro figure, again with a shawl draped over the left arm and below the right, suggests both a sense of volume and careful modelling, although the hands in this case cannot be called properly formed. The red sandstone torso from Harappa shows sockets for neck and shoulder and holes for nipples and possesses a remarkable similarity with historical sculptures in its smooth modelling, sense of volume, tautness and power. The grey stone figure in a dancing pose from Harappa suggests the posture of *Nataraja*, a dancing posture of Siva. The bronze dancing girl from Mohenjodaro is not really shown dancing but her nudity and confident posture with a leg thrust in front and arms resting on the knee and the left side of the waist put her in a class apart.

As compared to the earlier periods, the painting style of the mature Indus civilization is more confident, lush and altogether suggestive of a vibrant community. The brushwork of some painted sherds from Gujarat is reminiscent of swiftly done sketches, and in one case at least, where a deer is shown turning its head, the painter could be telling a folk story.

### *Skeletal Biology*

Human skeletons have been unearthed at various sites, including Mohenjodaro, Harappa, Lothal, Kalibangan and Dholavira. Technical studies have no doubt been published on some of them, but the inferences which one may draw about the people's health on the basis of such studies are still limited. On the basis of the skeletons discovered in the early excavations at Harappa, P.C. Dutta of the Anthropological Survey of India outlined some parameters of their skeletal biology:

The people were, on the average, moderately long headed, having an average cranial capacity, average medium-high vault of head in relation to the length of the head, and a relatively high vault in relation to the breadth of head. The calvarium shapes were mostly ellipsoids to spheroids in males and ellipsoids to ovoids in females. The forehead was moderately broad and highly receding in males, whereas it was fairly narrow and vertical to slightly receding in females. The upper face of the Harappans was medium or low mesen shaped with varying degrees of alveolar prognathism. The noses were highly mesorrhine or moderately platyrrhine, and the bridge of the nose was frequently concave, depressed at the base. Orbits were medium high. These people had moderately broad hard palates with paraboloid dental arcades. Though the lower-jaw width was short in both sexes, the jaw itself was relatively robust and larger in males than in females. The Harappans were above average in body height.[14]

The idea of investigating the genetic continuity of the Harappans led Dutta to examine some modern crania in the anatomy department of the Christian Medical College, Ludhiana (about 160 km to the east–south-east of the site of Harappa) and he tentatively reaches the conclusion that the results 'suggest a genetic continuum between the Harappans and the present-day people of the region'. This continuity of population has also been suggested by a brief mention of the results of unpublished studies on the skeletons excavated at Dholavira.

Among the diseases, thalassaemia and sickle-cell anaemia have been supposed to exist and both have been linked to malaria. At least one person at Harappa died of dental abscesses. Further, significant differences in a tooth condition—linear enamel hypoplasia—were found between the males and females, and this has been taken to 'suggest that a greater percentage of women were stressed by nutritional deprivation and/or serious illness than were men'. Nutritional deprivation of women is still common in many Indian households. The possibility of skeletal studies, including the studies of ancient DNA, are immense, down to the reconstruction of the actual living face. From this point of view the study of ancient Indian skeletal biology is still in its infancy.

## Chronological Framework[15]

The two limits of the Indus civilization are now easy to assess, based on the first and last occurrences of Harappan objects in independently dated contexts in Mesopotamia. The first occurrence is in the form of two bead-types—etched carnelian and long barrel-cylinder types—in the Royal Graves at Ur. These graves belong to Early Dynastic III A context of Mesopotamia, i.e. *c.* 2600 BC. These two bead-types do not occur in early Harappan context in the subcontinent. Besides, there is no evidence what-

soever of contact between the Indus region and Mesopotamia in the early Harappan context. The fact that they occur in the context of *c.* 2600 BC in Mesopotamia shows that the Indus civilization had already come into existence; *c.* 2600 BC is thus the earliest, archaeologically proven limit. The last limit is shown by the occurrence of a square Indus seal with a bull and pictographs in the Kassite context of *c.* fourteenth century BC at the Mesopotamian site of Nippur. The fact that the Indus civilization was alive during this period is also proved by the occurrence of two round seals with the Indus script in the Kassite context at Failaka. The 'fourteenth century BC' means the range of 1400–1300 BC. We can say that the Indus civilization came into existence by *c.* 2600 BC and was alive at 1400 BC and later. This is the baseline; the exact points of the beginning and the end are difficult to determine and perhaps not even necessary. But one may safely accept the broad chronology of the Indus civilization in the subcontinent from *c.* 2700 BC to *c.* 1300 BC.

Many radiocarbon dates are now available from the mature Harappan contexts. Sites which have each yielded a large number of dates are Harappa, Kalibangan, Lothal, Surkotada, Rojdi and Shortughai. Dates have been obtained from many other sites as well, but in limited numbers. At this point one has to note that all these sites did not come into existence simultaneously; they have their own variations in time. Taking all the calibrated dates of this civilization, it becomes apparent that the earliest focus is around 2600 BC, with only a limited number of dates suggesting an earlier focus, say, up to 2700/2800 BC. The lowest limit is more difficult to determine. At Mohenjodaro it was on its way out by 2000 BC, but the late phase of the civilization continued at many sites (cf. Hulas, Bhagwanpura) till *c.* 1300 BC and still later.

## Political and Social Framework[16]

Although the idea of a Harappan empire or kingdom has long been with us, the reality may be different. Considering the sheer extent of Harappan distribution and comparing it to a period of later Indian ancient history, except under the Mauryas for less than 200 years, this region was never under one rule. We postulate multiple kingdoms centred around the major settlements of a region. This means that in each distribution zone there could have been more than one kingdom. It is also likely that some of them were nothing more than city states. The prevalence of a common ideology over a wide region, which one may deduce from the many common symbols, the standardization of different Harappan artefacts and the general distinction between 'citadel' and ordinary residential area need not neces-

sarily mean political unity under one empire. On the other hand, in view of the fact that there were major individual settlements, each with its elite character, complete with organized civic layout, merchants and craftsmen, among other things, the idea of a local kingship and a local aristocracy does not seem remote. That such a situation was emerging and could have been a part of the mature Harappan scene is best seen at Kunal which is a comparatively small site but possesses aristocratic, possibly royal, paraphernalia of tiaras and armlets of a precious metal. As far as kingship is concerned, we do not envisage a Mesopotamian or Egyptian style kingship where the king is above the level of ordinary mortals, resplendent in his easily identifiable palaces and position in contemporary art. Indian kings were not necessarily less despotic but their value system was different and the royal power was also tempered by an ideal of duty. Archaeologically, all that we can associate with the great Mauryan king Asoka as an individual is only his inscriptions which would not have been engraved but for his wish to have a moral code engraved for his subjects in different parts of his empire. The rest is briefly told:

> Priesthood is far more sharply visible in the Mohenjodaro archaeological record. The concept of a *yogin*, one who sits in meditation, is writ large over the famous Mohenjodaro limestone head and a few miscellaneous pieces of human sculpture from the same site. Remains, such as those of fire-altars on the tops of platforms at Kalibangan, and similar remains elsewhere, though without the association of high platforms, unmistakably imply the services of priests—priests of a type that a practising Hindu would engage for performing his household rituals even today. . . . Merchants must have played a major role in the social and economic life because the overwhelming evidence of raw material procurement all over the Harappan distribution area leaves no room for doubt on this score. This is true of artisans, and one need not be surprised if both the merchants and artisans had their 'guilds'. . . . (Chakrabarti 1995)

The existence of a separate, enclosed residential area within the fortified 'citadel' complex at Kalibangan and Surkotada is remarkably intriguing. Some ritualistic and ideological sanctity must have been attached to people living in these areas. This sanctity was unlikely to have been backed by material wealth, because evidence of great disparity in material wealth between different groups of people is somewhat non-existent at Harappan sites. The conclusion which becomes inescapable is that there was a close link between the Harappan kings and priests.

## Decline and Transformation[17]

The idea of 'degenerate and, therefore, a Late phase of Indus' was first put forward by N.G. Majumdar in the context of pottery found in the upper

levels of two sites in Sind, Jhukar and Lohumjodaro. The Indus black-on-red style of pottery 'continued but in a modified style' and was accompanied by a coarse bichrome pottery which appeared for the first time. Majumdar further noted that at the site of Trihni this new pottery was found with a type of pots which had incised strokes at the shoulder and also occurred in the late level of Mohenjodaro. It is to Majumdar's great credit that he understood that certain ceramic changes were taking place towards the stratigraphically upper or late phase of the Indus civilization. In 1938, Mackay noted that the brick masonry of Mohenjodaro during its late period was poor by the standard of the earlier periods, and 'towards the end of the Late Period' a particular excavated area (G section of DK mound) came to contain potters' kilns, including one in the middle of its main street. That the potters could set up kilns in an area which was purely residential before was an indication that the civic standard had remarkably declined during this period.

> We have indeed, come upon a striking example of the decay of an once honourable city, the cause of which we suspect to be the vagaries of the Indus rather than pressure by invaders, of whose existence we have, in fact, little positive evidence.[18]

The idea that Mohenjodaro fell to a group of invaders is associated with Mortimer Wheeler (1947) and is based on two sets of archaeological data. First, in the upper levels of the eastern mound at Mohenjodaro there are about thirty-three randomly distributed skeletons of males, females and children. These skeletons are not contemporary; in one case it has even been established that the cut mark which it bears did not lead to death. This massacre idea is a myth. Second, in different areas of the north-west there are a few archaeological objects which are of west and central Asiatic derivation. They were not found in well-defined archaeological contexts. There is no reason why they should be called contemporary and indicate incoming invaders. However, such objects were forcibly interpreted that way and along with the above-mentioned skeletons led to the hypothesis that the Indus civilization in general and Mohenjodaro in particular fell prey to a group of invaders. The scenario still has its appeal in certain quarters. Certain objects of north Afghanistan affiliation, which have been found in the Quetta and Mehrgarh area in the vicinity of the Bolan pass, are being touted as markers of a foreign infiltration towards the end of the Indus civilization. The protagonists of this view ignore the facts that these objects may well belong to the mature Harappan period and that such finds in the Oxus–Indus interaction zone are only to be expected in view of the close trading network all over the interaction area. Besides, one does not have to interpret cultural change in the Indus-Hakra plain with reference to situations in the Bolan pass.

The decline and transformation of the Indus civilization has to be understood in its own terms, and it is here that we have to focus closely on archaeological stratigraphy and changing cultural situation, to which Majumdar and Mackay drew attention long ago in the context of Sind. The same point has been highlighted by the current excavations at Harappa. Overcrowding of the site has also been noted here towards the late phase and the period which has specifically been called Late Harappan is Period 5 characterized by a pottery known as Cemetery H ware (so called because this was first found in a cemetery marked H in M.S. Vats' early excavations at the site) and drains and burnt bricks of a smaller size. One notes that though the pottery changes, the elements of urban planning remain.

> This phase may reflect a changing focus of settlement organization that was a pattern of the earlier Harappan phase and not cultural discontinuity, urban decay, invading aliens, or site abandonment, as has been suggested in the past.[19]

This continuity was first observed in Gujarat in the context of Rangpur. Period IIA of Rangpur is mature Harappan. Deterioration in the quality of pottery, absence of drains and baths and thatched roofs of houses suggest to the excavator 'a decline in the prosperity of the surviving Harappans at Rangpur' in Period IIB. Mature Harappan pottery further disappears in Rangpur IIC which, however, develops a new pottery type which is known, because of 'the burnishing of the surface of the vessels after applying a thick red slip', 'lustrous red ware'. It is this pottery which becomes dominant in Period III: 'the Lustrous Red Ware culture,' as Rao showed at Rangpur, 'was not an intrusion from elsewhere but a local development of the Harappa culture itself.'

The evidence of transformation is clear in the Indo-Gangetic divide too. The transformation was initially worked out on the basis of stratigraphy and associated ceramic continuities and changes at sites like Mitathal and Siswal in Haryana. Siswal A is early Harappan, whereas Siswal B is mature Harappan and Siswal C late Harappan. There is no dramatic cultural discontinuity anywhere:

> Settlements are established and abandoned and items of material culture change through time, but there is no indication that the region was ever abandoned completely by humans nor witnessed a dramatic influx of foreign cultural groups.[20]

Continuity and transformation are the fundamental features of the phase after the mature Harappans in all their distribution areas. The cultural situation varied from area to area. In the Kachhi plain, the earlier tradition continued with new elements at the site of Pirak, whereas in south Baluchistan the Kulli culture might have lingered on. At Jhukar in Sind only a new pottery style emerged 'in association with the continuing

mature Harappan tradition without any break or sudden change in cultural continuity' but the Indus script was limited to potsherds and cubical stone weights became rare, among other things. Period 5 of Harappa—Cemetery H Ware culture—is best focused in Cholistan which has 50-odd sites of this period, including one *c.* 38 ha site, Kudwala. The entire area between the Sutlej and the Yamuna is dotted with late Harappan sites with a strong concentration in the upper Doab. Mud houses, faience ornaments, semi-precious stone beads, copper, ritualistic clay objects, terracotta toy-cart frames, kilns, fire-altars, storage pits, etc. are parts of the general late Harappan cultural complex in this region. There is no reason to think that its agricultural diversity and richness became any less during this period. In Gujarat, there is apparently a miscellany of situations, ranging from the small sites with cattle pens (cf. Kanewal) to the fortified ones like Rojdi and Bet Dwaraka. The use of script becomes less common in comparison with the earlier period but does not disappear. Agriculture remains firmly entrenched, as in the earlier period, and, if anything, may have even expanded its scope. The number of late Harappan sites in Gujarat, as elsewhere, is considerably more than the number of mature Harappan sites. In Gujarat at least the tradition of foreign trade continues; the discovery of a seal with a motif ('whorl' motif) common in the Gulf at Bet Dwaraka and the finds of Indus and Indus-related seals at Nippur and in Failaka are proof enough of this continuity of the mature Harappan tradition of external trade.

At the same time, there is a marked overall element of decline. The archaeological repertoire becomes much simpler; the use of script becomes very limited, and there was much less use of raw materials transported over long distances. While trying to explain this decline, one has to point out a major feature of the distribution of late Harappan sites between the Sutlej and the Yamuna. There was a remarkable shift of the focus of settlements towards the Doab during this period. We do not really know why this shift took place but the increased pace of the drying up of the Ghaggar–Hakra system seems to have been one reason. Another reason may have been the fact that the Harappans overstretched themselves. Their foundations in many areas of their distribution were not particularly deep. In Cholistan and some parts of Sind, west Punjab, Haryana and Gujarat they had an ancestry going back either to the Hakra ware period or the early phase of the early Harappans. Elsewhere in the Sutlej–Yamuna stretch the early Harappan phase did not antedate the mature Harappan by a long period; in the Doab there is no early Harappan at all, and in Gujarat there was a substantial group of microlith-using hunter-gatherers in the background.

> . . . One has to admit that the Harappans eventually came to be rather thinly stretched on the ground, and the weakening of their political fabric was almost inevitable. They were swallowed up, as it were, by the much less advanced pre-agricultural groups of inner India.[21]

We have noted that there was a marked shift in the focus of settlements towards the Doab. Once the Harappans moved in that direction and settled in the upper part of the Doab, they were geographically bound to be drawn into the main cultural development of the Ganga valley. Similarly, from the geographical point of view their dense distribution in Gujarat in the late Harappan period means that their interaction with, or movement towards, south-east Rajasthan, Malwa and the Deccan becomes a distinct possibility. As we shall see in the next chapter, there was a straight movement towards the Deccan along the Tapti valley, and there is evidence of interaction with both south-east Rajasthan and Malwa. The Harappans, in fact, were moving into the flow of cultural development of inner India.

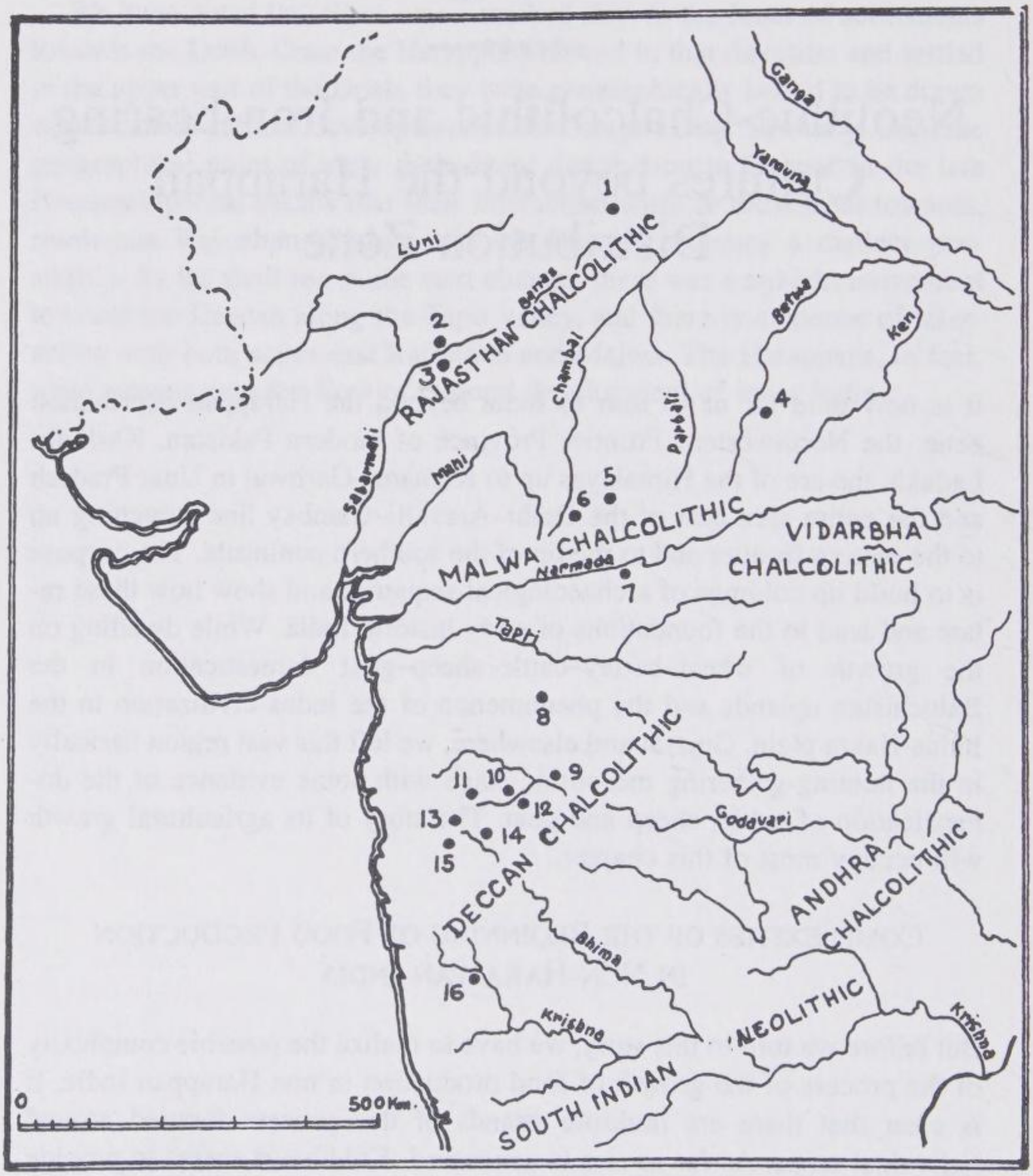
# VI

# Neolithic-Chalcolithic and Iron-bearing Cultures beyond the Harappan Distribution Zone

It is now time for us to turn to India beyond the Harappan distribution zone: the Northwestern Frontier Province of modern Pakistan, Kashmir, Ladakh, the arc of the Himalayas up to Kumaon–Garhwal in Uttar Pradesh and the entire area east of the Delhi–Aravalli–Cambay line stretching up to the eastern frontier and to the tip of the southern peninsula. The purpose is to build up columns of archaeological sequence and show how these relate and lead to the foundations of early historic India. While dwelling on the growth of wheat–barley–cattle–sheep–goat domestication in the Baluchistan uplands and the phenomenon of the Indus civilization in the Indus-Hakra plain, Gujarat and elsewhere, we left this vast region basically in the hunting-gathering mesolithic stage with some evidence of the domestication of cattle, sheep and goat. The story of its agricultural growth will occupy most of this chapter.

## Complexities of the Beginning of Food Production in Non-Harappan India

But before we turn to this story, we have to realize the possible complexity of the process of the growth of food production in non-Harappan India. It is clear that there are multiple strands of this process focused around individual crops. As far as rice is concerned, Koldihawa seems to provide the earliest evidence. The site is in the Belan valley (UP), an area with a rich prehistoric sequence down to the mesolithic (cf. Chopani Mando). Wild rice has been noted in the mesolithic level of the area. Domesticated rice comes from the earliest, metal-free level of Koldihawa and occurs in a context of wattle-and-daub houses, polished stone celts, microliths and

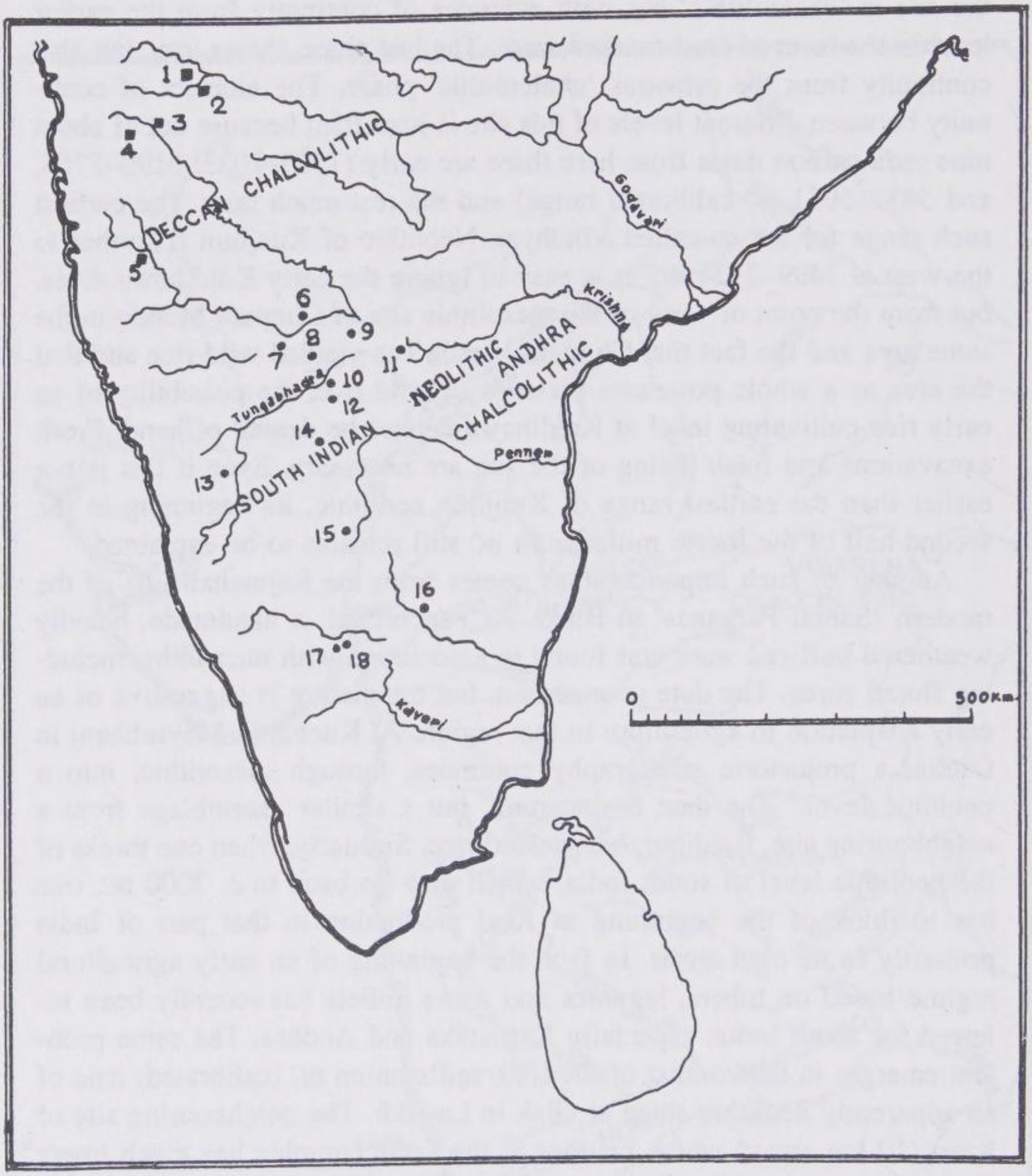



*This map is neither accurate nor to scale*

Map 5 General Distribution of Chalcolithic Sites from Rajasthan to South India
1. Ganeshwar, 2. Balathal, 3. Ahar, 4. Eran, 5. Kayatha, 6. Dangwada, 7. Navdatoli, 8. Bahal, 9. Apegaon, 10. Daimabad, 11. Jorwe, 12. Nevasa, 13. Khed, 14. Inamgaon, 15. Chandoli, 16. Songaon

three types of handmade pottery—cord-marked and incised ware, plain red ware with ochrous slip on both sides and a crude black-and-red ware. Rice occurred as husks embedded in the clay of the pottery. The second level of the site is 'chalcolithic' but with evidence of continuity from the earlier level in the form of cord-marked ware. The last phase shows iron, but also continuity from the previous 'chalcolithic' phase. The element of continuity between different levels of this site is important because out of about nine radiocarbon dates from here three are early (7505–7033, 6190–5764, and 5432–5051 BC calibrated range) and the rest much later. The earliest such range for the so-called Vindhyan Neolithic of Kunjhun II further to the west is 3499–3124 BC. It is easy to ignore the early Koldihawa dates, but from the point of view of the mesolithic site of Chopani Mando in the same area and the fact that Chopani Mando has yielded wild rice and that the area as a whole possesses varieties of wild rice, the possibility of an early rice-cultivating level at Koldihawa cannot be denied offhand. Fresh excavations and fresh dating of the site are necessary. Even if this is not earlier than the earliest range of Kunjhun neolithic, its beginning in the second half of the fourth millennium BC still remains to be explained.[1]

Another of such imponderables comes from the Rajmahal hills of the modern 'Santal Parganas' in Bihar. At Panchrukhi, a handmade, heavily weathered buff-red ware was found in association with microliths, including fluted cores. The date is uncertain, but the picture is suggestive of an early adaptation to agriculture in that region. At Kuchai in Mayurbhanj in Orissa, a prehistoric stratigraphy continues, through mesolithic, into a neolithic level.[2] The date is uncertain, but a similar assemblage from a neighbouring site, Baidipur, has yielded rice. Similarly, when one thinks of the neolithic level of south India, which may go back to *c.* 3000 BC, one has to think of the beginning of food production in that part of India primarily in its own terms. In fact, the beginning of an early agricultural regime based on tubers, legumes and some millets has recently been inferred for south India, especially Karnataka and Andhra. The same problem emerges in the context of the sixth millennium BC (calibrated) date of an apparently neolithic stage at Giak in Ladakh. The neighbouring site of Kiari (10 km away) which belongs to the same complex has much lower dates—not much earlier than *c.* 1000 BC. The uncertainties implicit in the data and dates from each regional situation are perplexing. What is clear, however, is that the process of the growth of food-production in India outside the distribution of the Indus civilization is much more complex and multilineal than the beginning of wheat–barley cultivation and the domestication of cattle, sheep and goat in Baluchistan. As far as the domestication of cattle, sheep and goat is concerned, we noticed in an earlier chapter




*This map is neither accurate nor to scale*

Map 6 Some Sites of the Deccan Chalcolithic and South Indian Neolithic
1. Daimabad, 2. Nevasa, 3. Inamgaon, 4. Chandoli, 5. Songaon, 6. Kodekal, 7. Piklihal, 8. Maski, 9. Kallur, 10. Tekkalakota, 11. Utnur, 12. Sanganakallu, 13. Hallur, 14. Brahmagiri, 15. Palavoy, 16. Paiyampalli, 17. T. Narsipur, 18. Hemmige

the 6th millennium BC evidence from Adamgarh and Bagor showing domesticated cattle, sheep and goat. This process is unlikely to have had anything to do with the process witnessed in Baluchistan. As one can perceive, this adds some complexity to the process of animal domestication too in the present context. On the whole, the transition to food production and the beginning of village life in non-Harappan India raises tantalizing questions to which we do not have answers at present.

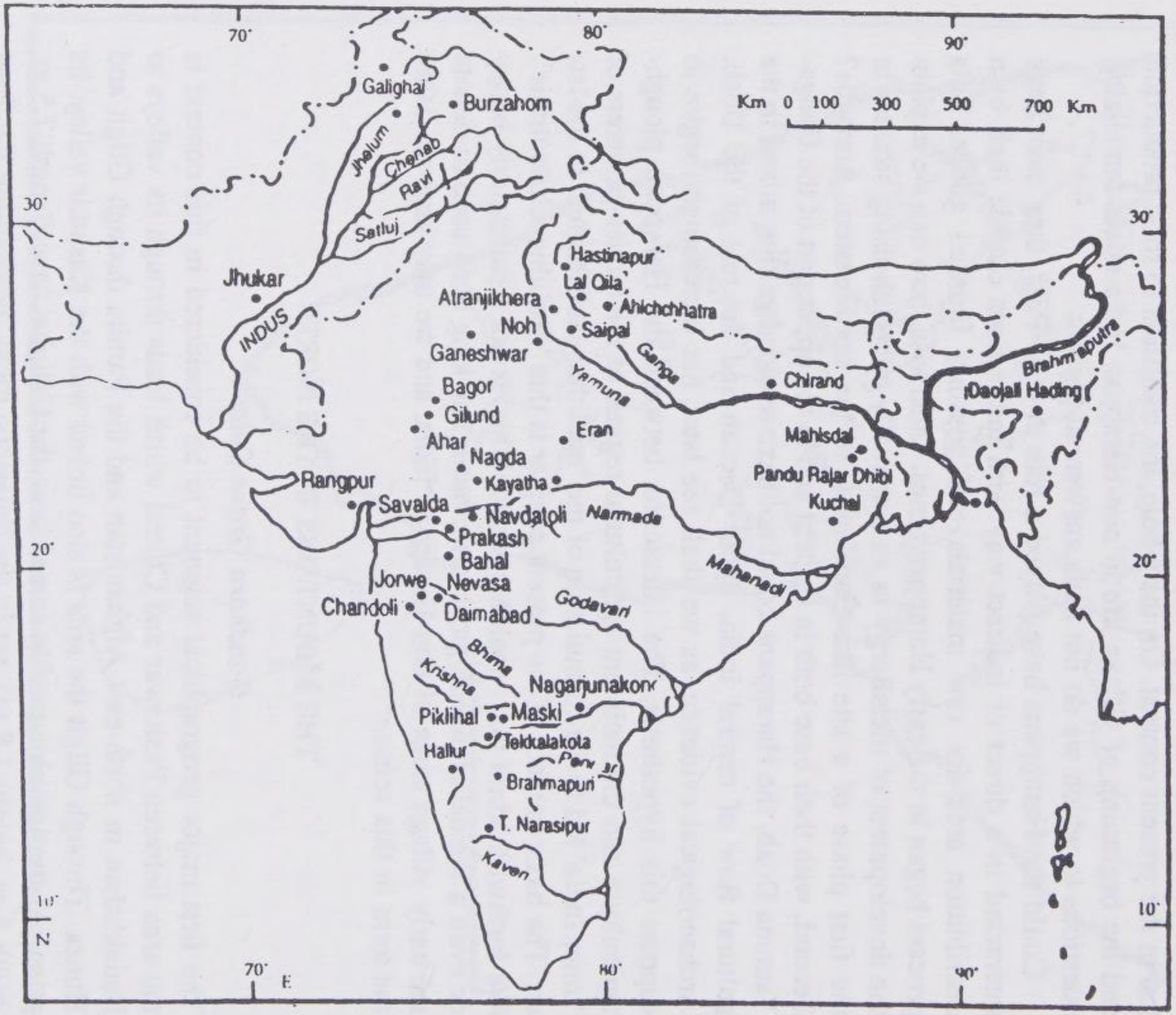
Could the Harappans have played a role in this? First, they must have interacted in a direct or indirect way with the regions outside their own distribution area for raw materials and possibly finished goods. This process began in the early Harappan times. Otherwise, how can we explain the development of metallurgy in an essentially microlith-using stratum in the first phase of a site like Ganeshwar in the north-eastern Aravallis? Second, with their base both in Gujarat and in the upper part of the Ganga-Yamuna Doab, the Harappans could not have avoided getting mixed in the cultural flow of central India, upper Deccan and the rest of the Doab. Archaeological evidence, as we shall see later, has increasingly begun to support this hypothesis. The interaction between the Harappan plough-agriculture and the incipient agricultural regime of the hunter-gatherers of 'inner India' led to the formulation of the 'neolithic–chalcolithic' in the latter. The basic content of the present chapter is this 'neolithic–chalcolithic'. We forthwith admit that 'neolithic–chalcolithic' is not a particularly happy or even a logical archaeological term, but it has long been used to denote the early village stage of non-Harappan India, and we may keep on using the term in this sense.

## THE MOUNTAINS IN THE NORTH

### *Gandhara Grave Culture*[3]

The first major geographical segment to be considered in this context is the area between Peshawar and Chitral which leads through its valleys to Badakhshan in north-east Afghanistan and the Pamirs through Gilgit and Hunza. Through Gilgit the area is also linked with the Kashmir valley. Its principal stratigraphic profile comes from the Galighai cave (length 7.5 m, width 8 m, height 1.8 m), set in the limestone rocks overlooking the Swat valley which at this point is 2 km wide.

Grave sites and associated settlements have been investigated at a large number of sites including Loebanr, Aligrama, Birkot Ghundai, Kherari, Lalbatai, Timargarha, Balambat, Kalako-Deray and Zarif Karuna located in the valleys of Chitral, Swat, Dir, Ghorband, Buner, etc. The typology of graves, as worked out at Timargarha, included, in chronological order, the following




Map 7 General Distribution of Neolithic-Chalcolithic Sites

types: (1) complete burial of single individual in a flexed position, (2) burial of cremated bones or ashes in urns or outside the urns (both single and multiple), and (3) burials of fractional bones or multiple burials. Wheat and barley occur in Loebanr III and Aligrama and rice has been found in Loebanr III. Pit-dwellings, some with thatched roofs on wooden superstructures above ground, have been found at Loebanr III and Kalako-Deray.

TABLE VI.1

The Sequence in the Ghaligai Cave
(after Stacul, 1969)

| | |
|---|---|
| Phase I (strata 24–21) | handmade brownish pottery, most with traces of slip and some with burnished interior—bone points and stone pebble tools and flaked pebbles |
| Phase II (strata 19–18) | very few flaked pebbles, but wheelmade fine pottery, the most common type being jar with high collar and everted rim decorated with simple black bands on a buff/red background |
| Phase III (strata 17–16) | exclusively handmade grey pottery and a large number of small flakes (raw material limestone), grinding-rubbing stone pieces, fragments of 'mace-head' or weights for digging sticks and bone implements |
| Phase IV (stratum 15) | a limited amount of black, grey and red handmade pottery including pedestalled and carinated shapes and some burnished variety—polished stone implements, bone implements—a jadeite pendant—elongated, leaf-shaped copper spearhead and fish-hook—shell bangle |
| Phase V (upper part of stratum 15) | Gandhara Grave Culture material—graves located on the hillsides—cist graves—with sides and floors made of stone slabs in some cases—cremation prevailing over inhumation—the associated settlements too on the hills and made of rectangular stone constructions—copper and bone implements—wide range of wheelmade pottery |
| Phase VI (middle phase of the Gandhara Grave Culture) | more inhumations than cremations—a very fine wheelmade pottery with great variety of shapes including chalices and cups-on-pedestals—only copper objects |
| Phase VII (late phase of the culture) | wheelmade red pottery—anthropomorphic terracottas—historical—iron |

Apart from the various excavation reports, there is no comprehensive study of the material from this area. Its distribution area possibly includes the Peshawar plain and extends as far east as Taxila. The Ghaligai

sequence acts as a marker, and it is important to note that the small limestone flakes of Ghaligai phase III have been reported from Jammu and Kangra. Their analogues also occur in the Hissar neolithic culture of Kazakhstan of central Asia. We have not yet understood the wider ramifications of this cultural development which seems to have taken place on both the slopes of the Hindukush system in this section. There are clear central Asiatic parallels of some pottery types, especially from Phase V onwards, but considering that this is likely to be a development on either side of the Hindukush, this is not surprising and does not suggest any significant population movement from one region to another. Further, it is this archaeological column which merges in the historical stream of the Northwestern Frontier region. The Ghaligai sequence possibly goes back to *c.* 3000 BC (calibrated) and the beginning of the Gandhara Grave Culture may be closer to 2000 BC than 1500 BC.

### *Kashmir Neolithic, Ladakh and Almorah (UP)*[4]

Phases III and IV of the Ghaligai sequence compare well with the neolithic sequence of Kashmir, as typified by excavations at Gufkral (1981–82) and Burzahom (1960–69, 1971–74). Kashmir, however, is a distinctly separate geographical identity—a small valley set in between the Pirpanjals on the west and south and the northern ranges on the north and east. The route to the Pamirs and central Asia through Gilgit and Hunza is clear and there are also other gaps in the Karakoram to the east as far as Ladakh. On the other hand, there are gaps in the Pirpanjals to link the valley with the plains of Jammu, Pakistani Punjab and the Potwar plateau. Neolithic sites are widely distributed in the valley between Baramula and Anantnag, the sequence as a whole being best represented at Gufkral, *c.* 41 km south-east of Srinagar.

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TABLE VI.2

*The Gufkral Sequence*

(after A.K. Sharma, IAR 1980–82: 19–25)

Period IA aceramic neolithic—two floor levels—large dwelling pits surrounded by storage pits and hearths (20–30 cm deep in the first level) and with post-holes around the mouths of the pits and hearths—no hearth within the dwelling pit itself—in the second level dwelling pits enlarged and circular, mud-plastered hearths in addition to the earlier rectangular types—in both levels: polished stone tools—a large quern with depression in the middle and red ochre paste sticking to it—bone/horn tools including small microlith-sized arrowheads with charred and polished tips—steatite beads—terracotta ball—wild sheep, goat and cattle, deer, ibex, wolf, bear—domesticated sheep and goat—barley, wheat, lentil

| | |
|---|---|
| Period IB | handmade, crude grey ware with mat-impressed bases—a 5–7 cm thick floor of compact clay mixed with lime all over the excavated area—also a 70 cm wide wall made of compact clay mixed with lime—disappearance of dwelling pits—bone and polished stone (?) tools—domesticated sheep, goat, cattle—domestic fowl—wild ibex, red deer and bear—in addition to earlier grains, *Pisum arvense* |
| Period IC | a large number of refuse pits and dumps—wheelmade pottery including grey and burnished grey, red and black types—stone querns, pounders, double-holed 'harvester', etc.—only one neolithic celt—bone implements—stone and terracotta spindle-whorls with incised designs—terracotta bangles, terracottas with relief design, potsherds with graffiti, spiral (single)-headed copper pin—domesticated sheep, goat, cattle, dog and pig—fish, hare, hedgehog, rodents and beaver |
| Period II | megalithic level characterized by menhirs at the site—continuation of earlier pottery types with emphasis on red pottery—copper—iron—rice and ragi millet |
| Period III | historical |

The earliest date from Gufkral IB is calibrated range of 2468–2139 BC, suggesting the possibility of period IA being as early as 3000 BC or a little later. The intriguing part of the Gufkral dates is the date of its iron-bearing Period II. There are only three iron objects—two points/needles and an indeterminate fragment. The four calibrated date ranges obtained for this period are 2195–1900 BC, 2131–1779 BC, 1885–1677 BC and 1888–1674 BC, positively indicating a date early in the second millennium BC for the first iron at Gufkral. At Burzahom, there is no aceramic phase or at least it was not recognized as such during the excavations. Here Period I means roughly Gufkral IB, although the details here are fuller: circular or oval-shaped dwelling pits (the largest: 2.74 m diameter at the top, 4.57 m at the bottom and 3.96 m deep); square/rectangular pit chambers (one recorded size: 6.4 m × 7 m); bone harpoons, needles with or without eyes, awls, spear points, arrowheads, daggers and scrapers; stone axes, chisels, adzes, pounders, mace-heads, points and picks; and mostly crude and handmade grey, buff and red pottery. The sides of the dwelling pits were mud-plastered and both ladders and steps were used to get inside the large ones among them. Storage pits (60–91 cm in diameter) containing animal bones, stone and bone tools have been found close to the dwelling pits. In the excavated pit chambers stone or clay hearths have been usually found in their centre. Interestingly, the pit chambers occupy the centre of the settlement whereas the oval/circular pits lie around the periphery. In both cases. however, there are indications of roofs supported by wooden pillars. Timber

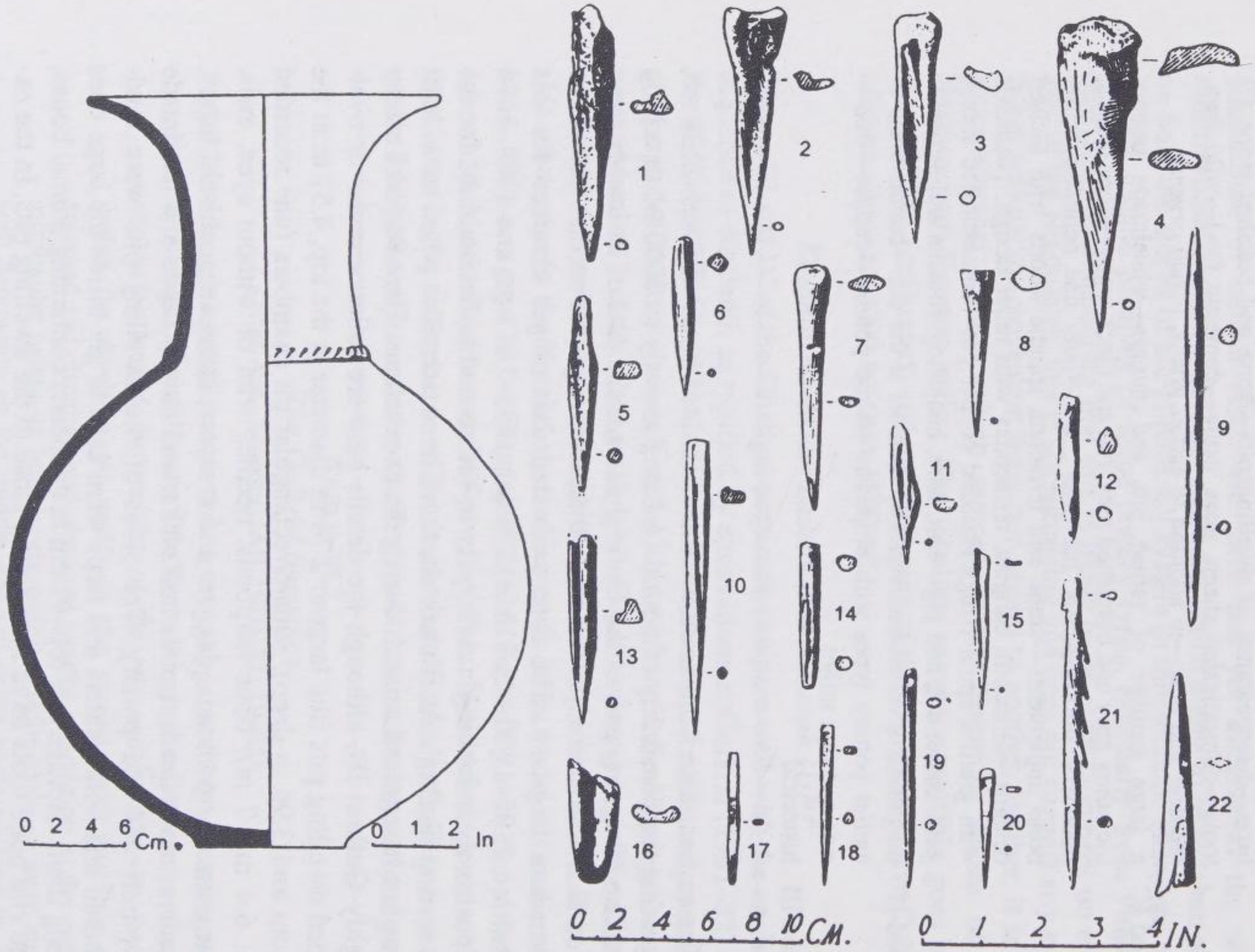



Fig. 28 Burzahom pottery and bone tools (*Indian Arch.—A Rev.*)

huts came up in Period II which also yielded a stone slab (originally of Period I) on which a hunting scene was found engraved: an antlered deer being pierced from the back by a human figure, with another figure shooting an arrow from the front and an additional feature of two representations of the sun and a dog. Another stone slab of this kind, although incomplete in its representation, occurs in this level. Graves, both of humans and animals, constitute an important feature of Burzahom. Human burials in the form of oval pits are found in floors and the general compound and filled up by ash, pieces of stone and potsherds. Trepanning features in one skull and secondary burials comprise mostly skulls and long bones. Animals (antlered deer, wolf, ibex, pig, nilgai, domestic cattle, buffalo, sheep and goat, and snow leopard) were either buried with the human dead or their meat was placed inside the human graves as offering. In some cases they were also separately buried in pits in house floors and the habitation area. Pottery continues to be generally handmade. There is a single copper arrowhead, but otherwise the use of stone and bone implements continues and includes the 'harvester' type. Two finds of this period show contact with the Indus plains: a wheelmade red pot with 950 carnelian and agate beads and another pot of the same type, which bears the 'horned deity' motif of early Harappan Kot Diji and Kalibangan. Animal burials and stone 'harvesters' link the Kashmir neolithic to the general context of the central Asian neolithic. Period II of Burzahom is 'megalithic' (menhirs at the site) where a smaller number of bone and stone tools continue to occur, and Period III is early historical. Period I at the site is *c.* 2800 BC (calibrated) and later. Period II continues into the second millennium BC.

The data from both Ladakh and Almorah are uncertain, mainly because the dates are both limited in number and inconsistent. However, they cannot be ignored altogether and apparently suggest a movement on both sides of the Karakoram and the Himalayas in protohistory, rather similar to the links we have seen in the context of the North-western Frontier and Kashmir. The average altitude of the area investigated in Ladakh is *c.* 3900 m and it gets vegetation only during the summer months (June–October). Here the Indus flows through a narrow gorge and the general habitation is sparse, although augmented by the influx of cattle-grazing pastoralists in summer. The handmade red pottery excavated at Kiari has been compared with similar pottery of Burzahom neolithic period II. Four hearths occur in three successive phases and there are domestic cattle, sheep and goat. Stone objects comprise saddle-querns, burnishers and pestles. The date is 1000+ BC (calibrated) but Giak, a similar site at a distance of less than 10 km and located in the same geographical situation,

yielded a single radiocarbon date which, when calibrated, goes back to the sixth millennium BC (4760 ± 130 BC uncalibrated). In the UP Himalayas near Almorah, megalithic burials (dolmenoids, cairns, menhirs and cist-burials) have been noticed and the upper filling of a cist exposed by a road cutting at Gagrigol yielded a date with calibrated range of 2666–2562 BC. The cist-burials of this area show 'horse burials' and red, grey and black pots with pedestalled bowls and spouted pots as common types. Analogies of this pottery have been sought, with doubtful validity, in Kashmir and the North-western Frontier. Uleri, an iron-smelting site near Almorah, shows a calibrated date-range of 1022–826 BC.

## RAJASTHAN[5]

### *North-east Rajasthan: Ganeshwar–Jodhpura Culture*

It was Jodhpura, a large mound on the bank of the non-perennial Sabi or Sahibi river in the vicinity of Kot Putli on the modern Delhi–Jaipur road, which first yielded evidence of this culture for which two early dates (calibrated ranges: 3309–2709 BC and 2879–2348 BC) are available at this site. Subsequently, the diagnostic pottery—wheelmade, orange to deep-red in colour, decorated with incised designs and possessing shapes including thick-slipped dish-on-stand, was found at Ganeshwar in a small Aravalli valley near Nim-ka-Thana on the Delhi–Jaipur railway line. Attention was focused on this culture after a large number of copper artefacts, including a distinct type of arrowhead, were found in the Ganeshwar excavations. Ganeshwar has been re-excavated and a large number of sites of this type have been located in various parts of north-east Rajasthan, especially in Sikar, Jaipur and Churu districts. No data are available on them except brief reports, but the presence of Ganeshwar-type arrowheads in Period II of Bagor in Bhilwara district (calibrated range 3501–3100 BC) identifies the culture as belonging to the late fourth millennium BC. We argued earlier that the craft-specialization represented by almost a mass manufacture of copper implements at sites like Ganeshwar in the Aravallis of north-east Rajasthan and their export to the early Harappan sites of the Ghaggar-Hakra system (cf. Kalibangan and Kunal) was one of the major factors that generated the process leading to the emergence of the Indus civilization. The north-eastern Aravallis in Rajasthan and their outliers in Haryana extending up to Tosham constitute a major copper and tin zone, and, as we shall see later, this region as a whole has constituted perhaps the most important metallurgical area of the subcontinent from the early Harappan times onwards. With this brief preamble we turn to the excavated profile of Ganeshwar.

TABLE VI.3

*The Ganeshwar Sequence*

(after P.L. Chakravarty and V. Kumar, IAR, 1987–88)

| | |
|---|---|
| Period I | microlithic industry of chert and quartz and charred bones of presumably wild animals |
| Period II | circular hut outlines with paved (pebbles and pieces of rock) floors—both handmade and wheelmade pottery including a thick-slipped red pottery—pottery generally crude, but some well-made sherds as well—microliths and animal bones—copper objects (5 arrowheads, 3 fish-hooks, 1 spearhead, 1 awl) |
| Period III | lesser quantity of microliths and animal bones—a wide range of wheelmade pottery of early or 'pre-Harappan affinity'—several hundred copper objects including arrowheads, rings, bangles, spearheads, chisels, balls, celts, etc |

One would expect Period I of Ganeshwar to be food-producing in some way because otherwise it would be a case of a jump from the postulated hunting-gathering stage of Ganeshwar I to the effective metallurgy of Ganeshwar II. It is situations like these which remind us time and again that much regarding the beginning of food production in India is still unknown. Ganeshwar is a 3 to 4 acre site, and strangely enough the reports do not mention anywhere the direct evidence of smelting in the excavations.

### *South-east Rajasthan: The Ahar Culture*

Its sites (more than 90; *c.* 2 to 10 acres and more in size; general location on river banks; usually within 8 to 16 km of each other) have been traced in the drainage systems of the Banas and Berach rivers roughly between Udaipur and Jaipur, and one suspects that its present concentration in the Mewar plain of Udaipur, Chitorgarh and Bhilwara districts is because of the lack of exploration in other Rajasthan areas to the north-east beyond Bhilwara. The gneissic plain of Mewar grades into the Malwa plateau of Madhya Pradesh, and it is not a surprise that the sites of this culture have been known to occur in the Mandasore district of MP. Two sites, Ahar and Gilund, were excavated earlier (Ahar in 1953–54 and 1961–62; Gilund in 1959–60), but it is the recent work at Balathal (1994–98) which has provided a much fuller evidence. This site which originally covered *c.* 5 acres is now much destroyed and lies at the edge of a large natural depression which has led to a high water-table and the consequent ease of irrigation from wells in this area of about 75 cm of average annual rainfall. The early historic period at the site followed its protohistoric habitation after a long gap represented by a culturally sterile layer.

Fig. 29 South-east Rajasthan chalcolithic sites (Misra, 1977)

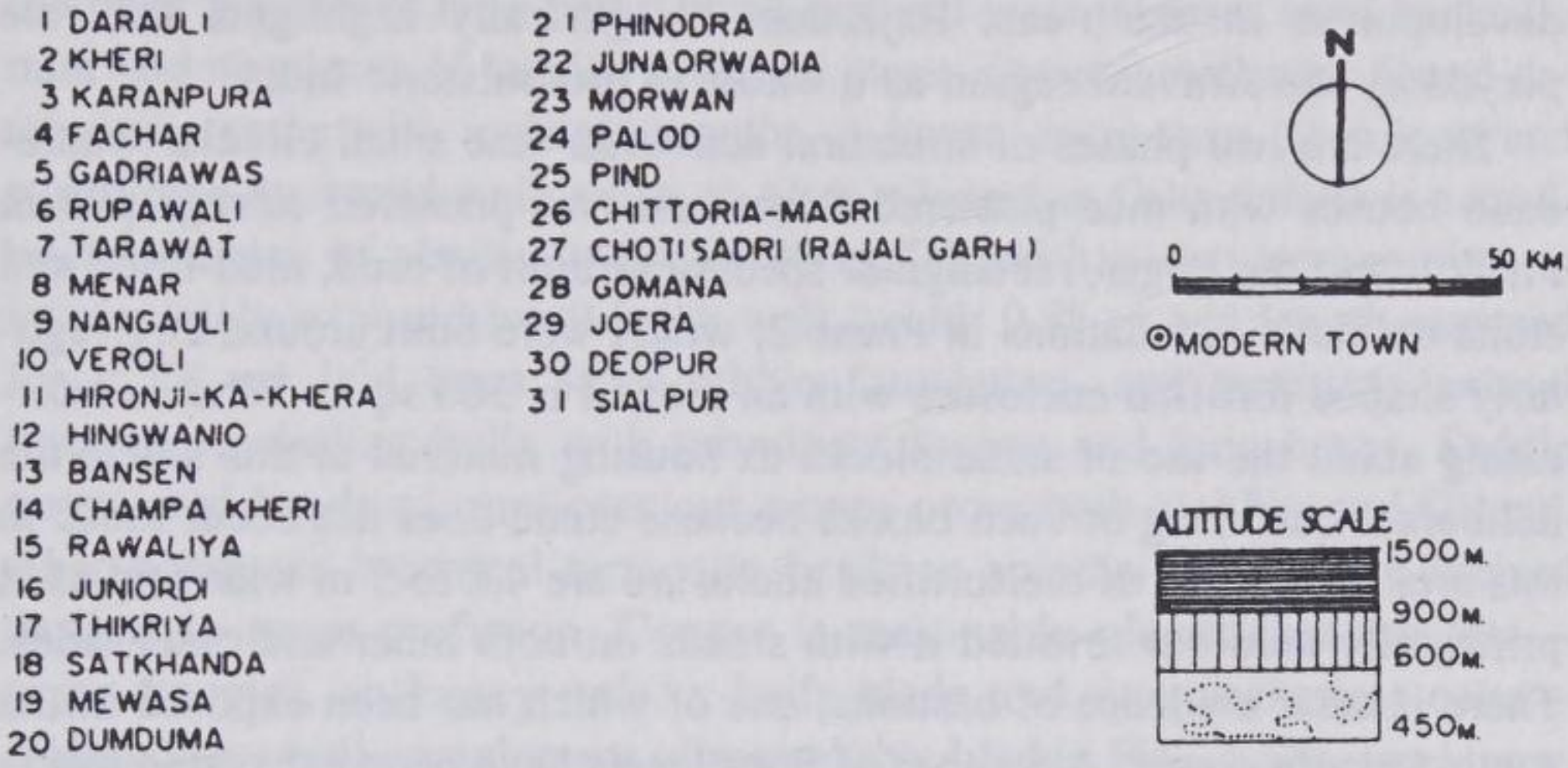



Fig. 29 (*Contd.*) South-east Rajasthan chalcolithic sites (Misra, 1977)

The protohistoric chronology of Balathal has added a new, if not revolutionary, dimension to our understanding of the Ahar culture. The excavators rightly point out *c.* 2600 BC (uncalibrated) as the general period of its beginning, with the general dates of its middle and late levels being *c.* 2400/2300 BC (uncalibrated) and *c.* 1800 BC (uncalibrated), respectively. What they curiously fail to consider is the implication of the calibrated range of these three chronological points: *c.* 3300–2900 BC (calibrated), *c.* 2900–2600 BC (calibrated) and *c.* 2200–2000 BC (calibrated). There should not be any doubt about the beginning of protohistoric occupation at Balathal towards the closing centuries of the fourth millennium BC. This has three major implications. First, this is as early as the beginning of early Harappan occupation at Kot Diji, among other sites, and second, this is also as early as the beginning of Ganeshwar–Jodhpura culture of north-east Rajasthan. Third, the non-iron phase of the protohistoric occupation of the area continued till *c.* 2000 BC or a little later. Its chronological contemporaneity with the Ganeshwar–Jodhpura culture is demonstrated by the occurrence of red-slipped incised and reserved slip wares at both Ganeshwar and Balathal and by the occurrence of a Ganeshwar-type copper arrowhead at Balathal. On the basis of present evidence, we would argue that from the late fourth millennium BC onwards there were two distinctive but interrelated chalcolithic growths along the Aravallis in north-east and south-east Rajasthan. Metallurgically, and from the point of view of its contribution to the intensification of craft specialization as a major factor leading to the growth of the mature Indus civilization, the growth in north-eastern Rajasthan has a very distinct character of its own. However, the fact that there was another major contemporary chalcolithic village

development in south-east Rajasthan categorically highlights the role played by the Aravalli region as a whole in protohistoric India.

There are two phases of structural activities—the small circular wattle-daub houses with mud-plastered floors and two plastered storage pits in Phase 1 and the larger, rectangular specimens built of mud, mud-brick and stone on stone foundations in Phase 2, which were built around an irregularly shaped fortified enclosure with an area of *c.* 500 sq m. What is interesting about the use of stone blocks as housing material at this site is the deliberate quarrying of such blocks because stone does not occur loose in this area. The walls of the fortified enclosure are 4.8 to 5 m wide and used principally mud but revetted it with stones on both inner and outer sides. There is clear evidence of bastions, one of which has been exposed in the south-western corner. A number of floor levels have been excavated inside the fortified enclosure but it fell into disuse before the protohistoric occupation at the site came to an end. A street of irregular width (2.7 m in the north, 2 m in the centre and 4.8 m in the south) with a north-west–south-east orientation runs across the settlement and is further associated with a small lane.

The structural complexes, three of which have been exposed, are multi-roomed, and it has been possible to identify kitchen and storage spaces in them. Two potters' kilns have been found in two successive phases, the earlier one measuring 5 m (E–W), 4.8 m (N–S) and 70 cm (height). The main pottery types are thin red ware, tan ware, black-and-red ware, buff ware, reserved slip ware, thick red-slipped ware and grey ware. Microlithic tools occur but in a limited quantity. On the other hand, the copper objects—choppers, knives, razors, chisel, arrowhead and a six-petalled flower—are relatively abundant. Cattle, buffalo, sheep, goat and pig are the domesticated animals, cattle being the predominant group. The size of the cattle falls within the size range of the Malawi and other cattle breeds of the area. Several varieties of deer, turtle, pea-fowl, fowl, fish and molluscan shells have also been identified in the archaeo-zoological record. The plant remains comprise wheat, barley, at least two varieties of millet (Panicum millet and Italian millet), black and green gram, pea and linseed, among miscellaneous weeds and items like jujube. The miscellaneous antiquities include terracotta bull figurines, terracotta and semi-precious stone beads, terracotta balls and stone querns, grinders and hammerstones.

There is no direct evidence of metal-smelting at Balathal as yet, which, however, does exist at Ahar in the outskirts of modern Udaipur in the form of copper sheet and slag. Ahar (27.5 acres) is much larger than Balathal and so is Gilund (*c.* 41 acres). Pottery types are similar at all these places,

the most prominent type being black-and-red ware. Houses used basically mud laid on pieces of locally collected stone. Ovens/hearths are found extensively, some with multiple mouths. A house, more than 10 m long and partitioned by a mud wall, exists at Ahar, whereas at Gilund there is a mud-brick complex of about 30.48 × 24.38 m. Gilund has also storage pits, an incompletely exposed burnt-brick wall (width 0.55 m and length exposed for *c.* 11 m) laid on a stone-rubble foundation, and terracotta animal figurines including bulls with prominent humps and long horns. Saddle querns and beads of semi-precious stones occur both at Ahar and Gilund. Ahar possesses biconical terracotta beads or spindle-whorls with incised designs in some profusion. Copper is reasonably plentiful at this site—rings, bangles, antimony rods, a knife-blade and four socketless celts—with only a small complement of microlithic blades. Fish, turtle, fowl, cow, buffalo, goat, sheep and deer constitute the animal remains at the site which has also yielded rice. A lapis lazuli bead and five etched carnelian beads are clear evidence of contact between Ahar and the Indus civilization. No such unmistakable evidence has yet emerged from Balathal.

The protohistoric Ahar (Period I at the site) has three phases—a, b and c. The earliest calibrated points of Ia, Ib and Ic are *c.* 2500 BC, *c.* 2100 BC and *c.* 1900 BC respectively. The beginning of occupation at Ahar is later than at Balathal. An iron ring and a nail occur as early as Ahar Ib and iron is fairly common in Ahar Ic—arrowhead, chisel, peg and socket. Despite a long-drawn controversy over the occurrence of iron in the protohistoric levels of Ahar, there is no special reason to doubt the validity of this occurrence.

## MADHYA PRADESH[6]

The protohistoric archaeology of Madhya Pradesh is dominated by that of the Malwa region which is a large fertile plateau drained by the Chambal, Kali Sindh, Narmada, Sipra, Betwa and other rivers, and has some trunk routes from the north to the Deccan and west India passing through it. The area is dotted with chalcolithic sites but there is no comprehensive study of their location and distribution, and out of many sites excavated, full reports are available only on Nagda, Kayatha and Navdatoli. Nagda was only vertically excavated, and for the present discussion we shall depend primarily on Kayatha and Navdatoli reports and make only passing references to the other sites.

As noted earlier, with their base in Gujarat, the Harappans were suitably located to interact with the Malwa region. In fact, in th Morena district, which lies in the north-eastern segment of the Malwa region, late Harappan

sites were discovered at three places—Sihoniya, Khudai and Bassaiya—on the banks of the Asan, a tributary of the Chambal. The sites were found destroyed but pottery remained: 'the late Harappan sturdy and thick red ware of fine fabric with such types as dish-on-stand, vase with disc base, etc.' The report came from S.A. Sali, a distinguished archaeologist, and when one combines such reports with V.S. Wakankar's report on Manoti (Mandasore district), one is inclined to accept the postulate of a Harappan/late Harappan beginning of the Malwa chalcolithic. At Manoti Wakankar mentions some Harappan pottery types in the lower levels associated with a citadel which had '11 ft thick walls and a square bastion at turning points'.

However, this phase in Malwa is still ill-defined. The well-defined successive phases are the Kayatha, Ahar and the Malwa cultures, each with their own assortment of pottery and hence identified as different. Otherwise the succession is continuous. There is a 12 m thick occupational deposit at Kayatha where the modern village is located on the ancient mounds on the bank of the Chhoti Kali Sindh, a tributary of the Kali Sindh, itself a tributary of the Chambal. Over 40 sites of the Kayatha culture have been located in the north-western part of Madhya Pradesh, mostly in the Chambal valley. The calibrated date range of this culture is the second half of the third millennium BC. The typical 'Kayatha ware' is fine, sturdy, wheelmade and bears linear painted designs in violet on a thick brown slip which is usually applied from the mouth to the shoulder but also occasionally continues down to the base. Jars with a globular profile, bowls with thickened incurved rim and carinated shoulder, and large storage jars with heavy beaded rim are some major shapes in this pottery. The 'Kayatha ware' is associated with a red-painted buff ware and a red combed ware. The major shape in the thin-walled red-painted buff ware is *lota*, a small vessel with a flaring mouth, round bottom and carinated body. 'Buff' colour is the result of a wash and haematite pieces were used to paint linear designs on this surface. The red 'combed ware' is sturdy, bears wavy and zigzag lines and has only bowls and dishes as shapes. The large storage jars are crude and handmade with incised and applique designs. There is an extensive microlithic blade industry of locally available fine-grained chalcedony, but there are also two copper axes (cast in moulds) and 27 copper bangles in two pots. There are also weights for digging sticks. Two necklaces made of agate and carnelian beads (175 beads in one, and 160 beads in another) were found in two pots. Another pot contained 40,000 micro-beads of steatite. Domesticated cattle and horse figure in the faunal assemblage. The houses were made of mud and reed and had mud-plastered floors. An excavator of the site, M.K. Dhavalikar, believes

that the 'Kayatha ware' has an early Harappan affinity and that its steatite micro-beads are identical with Harappan specimens. The Kayatha axes bear round indentation marks, a feature noticed on the Ganeshwar specimens too, and the probability of Ganeshwar being their source is high.

Apart from its diagnostic ceramic, white-painted black-and-red ware, the important feature of the Ahar culture level at Kayatha is the large number of terracotta bull figurines and in some cases the natural form of the bull is eventually reduced to a pair of horns on a pedestalled base.

The third chalcolithic level in Malwa is constituted by the Malwa culture, the type site of which is Navdatoli (1952–53, 1957–59) on the southern bank of the Narmada south of Indore. The typical 'Malwa ware' is a buff or orange-slipped ware with linear, geometric and occasionally stylized naturalistic designs in black or dark brown. Among the shapes one may mention *lota*, concave-sided bowl, channel-spouted bowl and pedestalled goblets. There are both circular and oblong wattle-and-daub houses. The diameter of the circular houses varies between *c.* 1 m and *c.* 4.5 m, the small ones being obviously used as stores for grains and hay. The rectangular houses are 5 to 6 m long. The walls and floors are plastered with lime and there are lanes between the houses. The microlithic blade industry is plentiful (over 23,000 specimens) and was produced probably in individual households. At Navdatoli there are copper flat-axes, wire-rings, bangles, fish-hooks, nail-parers, chisels, thick pins and a broken mid-ribbed sword. The analysed specimens have revealed both tin and lead alloying, and the axes carry round indentation marks like the Ganeshwar specimens. Saddle querns, rubbers, hammerstones, maceheads or weights for digging sticks form the general run of objects made of stone. There are beads of agate, amazonite, carnelian, chalcedony, faience, glass, jasper, lapis lazuli, steatite, shell and terracotta. Terracotta animal figurines and spindle-whorls have been found. Two varieties of wheat, linseed, black gram, green gram, green peas, *khesari* or *Lathyrus sativus* and rice (not in the earliest level but slightly later) were cultivated. There were domesticated cattle, sheep, goat and pig. Deer were hunted. The evidence of religion has been found extensively in the Malwa cultural level and Navdatoli itself shows some of it—a pit (2.3 × 1.92 × 1.35 m) dug in the floor at the centre of a house, with its sides and floor plastered with mud and charred wood at its four corners; a storage jar which shows on it in applique a shrine with a female worshipper on the right and a lizard on the left. The calibrated date range of the Malwa culture at Navdatoli is roughly *c.* 2000–*c.* 1750 BC. Among other sites, Nagda and Eran suggest massive mud walls which could have been parts of a fortification. At Azadnagar near Indore, a child was found buried (in N–S orientation, with feet cut off

after death) in the house-floor with a microlithic blade with serrated edge and a small terracotta tablet below the head. Wakankar is of the view that there was more rice than wheat in chalcolithic Malwa. There was 'profuse use' of rice husk. Cattle/bull figurines occur in hundreds and may suggest Saivite belief of some kind. This is also supported by some terracotta representations of the phallus. At Dangwada he reports 'a female torso and phallus combination'. Many of the bull forms and bulls bear nailimpressed crescentic decoration. Wakankar further believes that in Phase 2 of Dangwada bull-worship declined and in its place appeared 'conical cult objects in houses and shrines'. There were pot-stands with bull and serpent figures and serpent designs on the Malwa pottery. There was fire sacrifice in circular fire-altars. He further believes that there was a separate room for performing rituals in many houses. However, the Dangwada report is only briefly published, and these assumptions cannot be confirmed.

At Nagda, the chalcolithic level was succeeded, after a short duration, by an iron-using level which shows continuity from the earlier chalcolithic level. On this basis the date of the beginning of the iron-bearing level at Nagda should be well within the second millennium BC.

## MAHARASHTRA[7]

In the northern fringe of Maharashtra the Tapti valley forms the Khandesh plain, while further east there are the plains of the Wardha and Wainganga rivers, roughly constituting Berar or the ancient Vidarbha region. Leaving aside the Konkan coast and the Western Ghats which separate this coast from the interior, the rest of Maharashtra is drained by the Godavari, Bhima and their tributaries. The distribution and depth of black soil determine the richness of agricultural areas of this semi-arid plateau which receives 330–570 cm of average annual rainfall. The routes from Malwa, having crossed the Tapti, move straight to the Konkan coast via Nasik on the one hand and the interior of the plateau on the other. The latter also goes to Andhra or to the Krishna-Godavari delta through Paithan or ancient Pratisthana. These two major lines of movement link up with many lesser but significant historical routes.

The distinctive chalcolithic culture of Maharashtra is known as the Nasik–Jorwe or simply Jorwe culture, named after the type site excavated in the 1950s. Since then a large number of sites have been excavated and suitably published, but in recent years their usefulness has to some extent been marginalized by the scale of work at Daimabad in the Godavari system and Inamgaon in the Bhima system. As in Malwa, different cultural names have been given to the different segments of the protohistoric

archaeological sequence on the basis of their diagnostic pottery. Daimabad on the bank of the Pravara river shows the entire sequence.

It begins with the Savalda culture which, according to the excavator, may go back to the mid-third millennium BC and is characterized by 'Savalda ware', a microlithic blade industry, two copper bangles, four beads (conch shell, carnelian, steatite and terracotta), ring stones, saddle querns, a phallus made of agate, bone tools, cultivation of wheat, barley, lentil, pea and black gram/green gram, and a number of houses, one of which has been identified as a priest's house. The brown, blackish and chocolate-coloured 'Savalda ware', first found at Savalda in the Tapti valley, is made on a slow wheel and is of medium to coarse fabric with a thick and crackled slip. The painted designs include tools, weapons and geometric motifs. The shapes are high-necked jar, dish, dish-on-stand, basin, bowl, ring-stand, beaker, vase, knobbed lid, etc. The mud-walled houses were open on one side, and the so-called priest's house has been thus identified on the basis of its large size, considerable space between it and its neighbours and the presence of an agate phallus in a hearth inside. This picture of the Savalda culture contrasts with the picture of a semi-nomadic community derived from the 50 cm thick occupational deposit of a 20 ha site called Kaothe. Here the distinctive house-type is a sloping roof resting on a bunch of sticks tied at the top and coming down over a circular/oval pit floor. There were also many bone tools, domesticated cattle, buffalo, sheep/goat, dog, a variety of millets (*Pennisetum typhoides*), gram and moong pulses, and beads of shell, opal, carnelian and terracotta.

In Period II or the late Harappan period the size of the site increased to *c.* 20 ha. The main pottery type was a fine wheelmade sturdy red ware of which the main shapes were dish-on-stand, bowl-on-stand, dish and vase. The designs painted in black were geometrical and linear. In addition, there were burnished grey ware, a thick coarse handmade ware and a few sherds of ribbed bichrome and deep red wares. The houses of this period (the largest one 6.3 × 6 m) lay on either side of a 30 to 50 cm wide wall made of black clay, which has been traced for a length of 33 m. There were two button-shaped seals with Indus signs and four inscribed potsherds. An extended burial in a mud-brick-lined grave, where the skeleton bore signs of being originally covered by reeds of fibrous plants and the mud-bricks were in the classic Indus ratio of 4:2:1, was also found. Copper slag is present and thus copper was smelted at the site during this period. Among other items one may mention a microlithic blade industry, a wide range of stone and terracotta beads, shell bangles, gold beads, a terracotta measuring scale (not yet closely studied), a miscellaneous stone industry comprising saddle querns, mullers, etc. and a purposefully shaped semi-circular

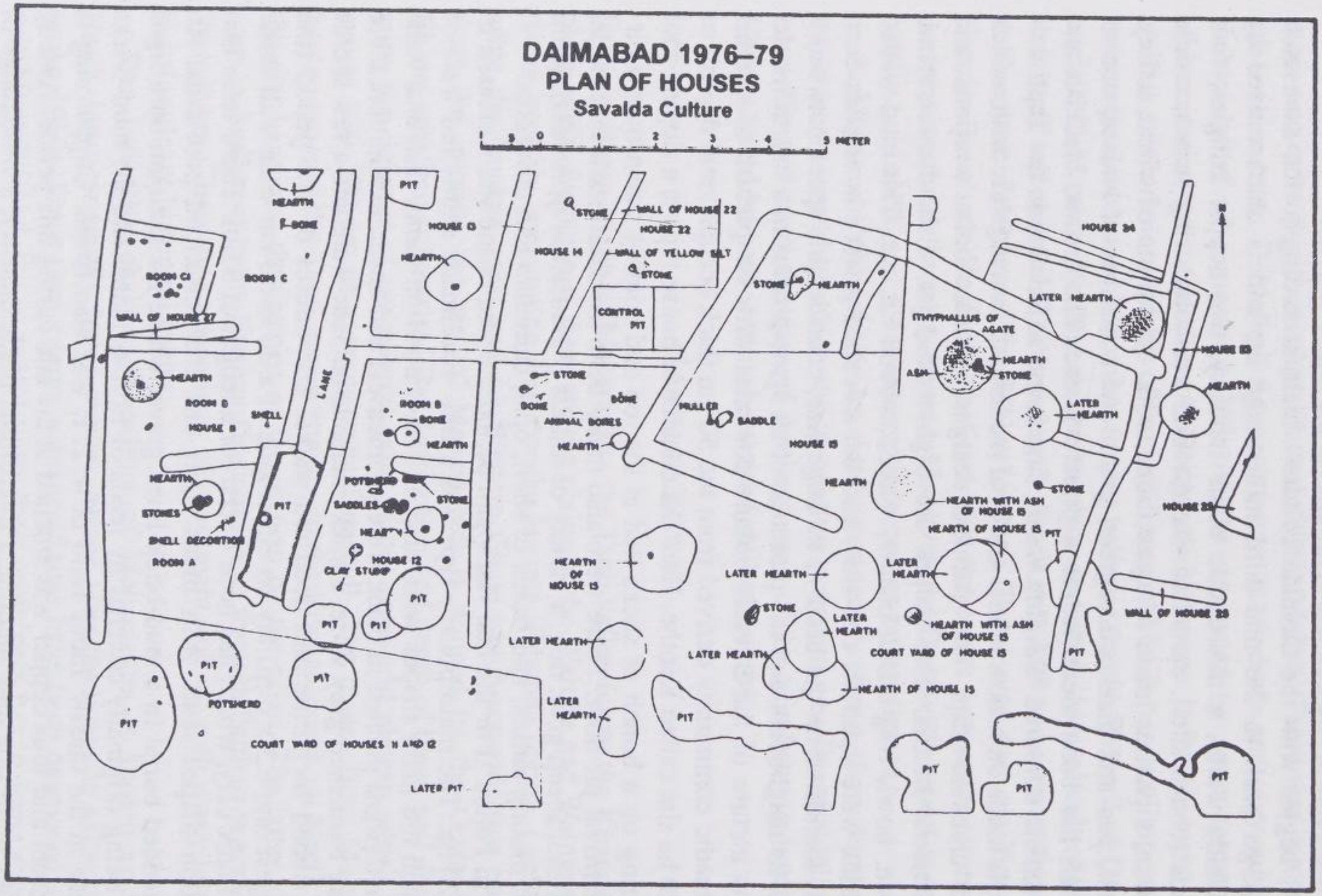



Fig. 30 Savalda houses, Daimabad (Sali, 1986)

piece of red ware which shows on one side the incised figure of a tiger jumping on the back of a buffalo. Horse gram was the only new addition to the range of food-grains of the earlier period.

An outstanding find of this period at Daimabad is a hoard of four heavy solid-cast copper objects (weighing 60 kg in all) showing a man driving a chariot (total length 45 cm, width 16 cm), a buffalo (overall height 31 cm, length 25 cm) on a four-legged platform attached to four solid wheels, an elephant (overall height 25 cm, the platform 27 cm long) on a similar platform but with its axles and wheels missing, and finally, a rhino (25 cm long, 19 cm high) shown standing on the axles of four solid wheels (the distance between the two sets of wheels is 13 cm). Although the hoard was found outside excavations, the spot was later correlated to the archaeological stratigraphy and there is no valid reason to doubt its ascription to the late Harappan context. What is further interesting is that the head of the man driving the chariot closely resembles the head of a male figure found at a site near Jaipur. We suspect that the objects came to the Deccan from the metallurgical complex of the north-eastern Aravallis.

Period III at Daimabad is a somewhat vague entity defined as Daimabad culture. The diagnostic pottery seems to be a black-on-buff/cream ware, and among the other types are black-painted red, black and grey corrugated ware with or without paintings, black ware, burnished grey and thick coarse wares. Both microlithic blades and bone tools occur, and there is a rich bead industry. Hyacinth bean is a new addition. A worked piece of an elephant tusk is interesting, and so is the occurrence of three burials, each belonging to a distinct type: a pit burial, a symbolic burial and a post-cremation pot burial. There is a small part of a copper-smelting furnace, and perhaps more interestingly, there is a part of a presumably male figure in applique on the *inside* wall of a vase.

Daimabad Period IV is 'Malwa culture', with the distinctive Malwa ware, a few sherds of black-and-red ware, burnished grey and thick coarse wares. There is an extensive structural evidence belonging to this phase. A number of them have been identified as religious structures mainly on the basis of the occurrence of fire-altars in them. A house has been described as a coppersmith's workshop because it showed two hearths, one of them with a copper razor. The house structures were mud-walled (8 to 30 cm thick walls) and generally spacious and rectangular with semi-circular or rectangular mud-steps at the entrance, single or double flap doors, mud-plastered floors, hearths and the use of wooden posts in walls. The sixteen excavated burials were either urn or pit burials, with the twigs of a fibrous plant spread at the bottom of the pit. Copper objects, a microlithic blade industry, a rich bead industry and miscellaneous terracotta and bone

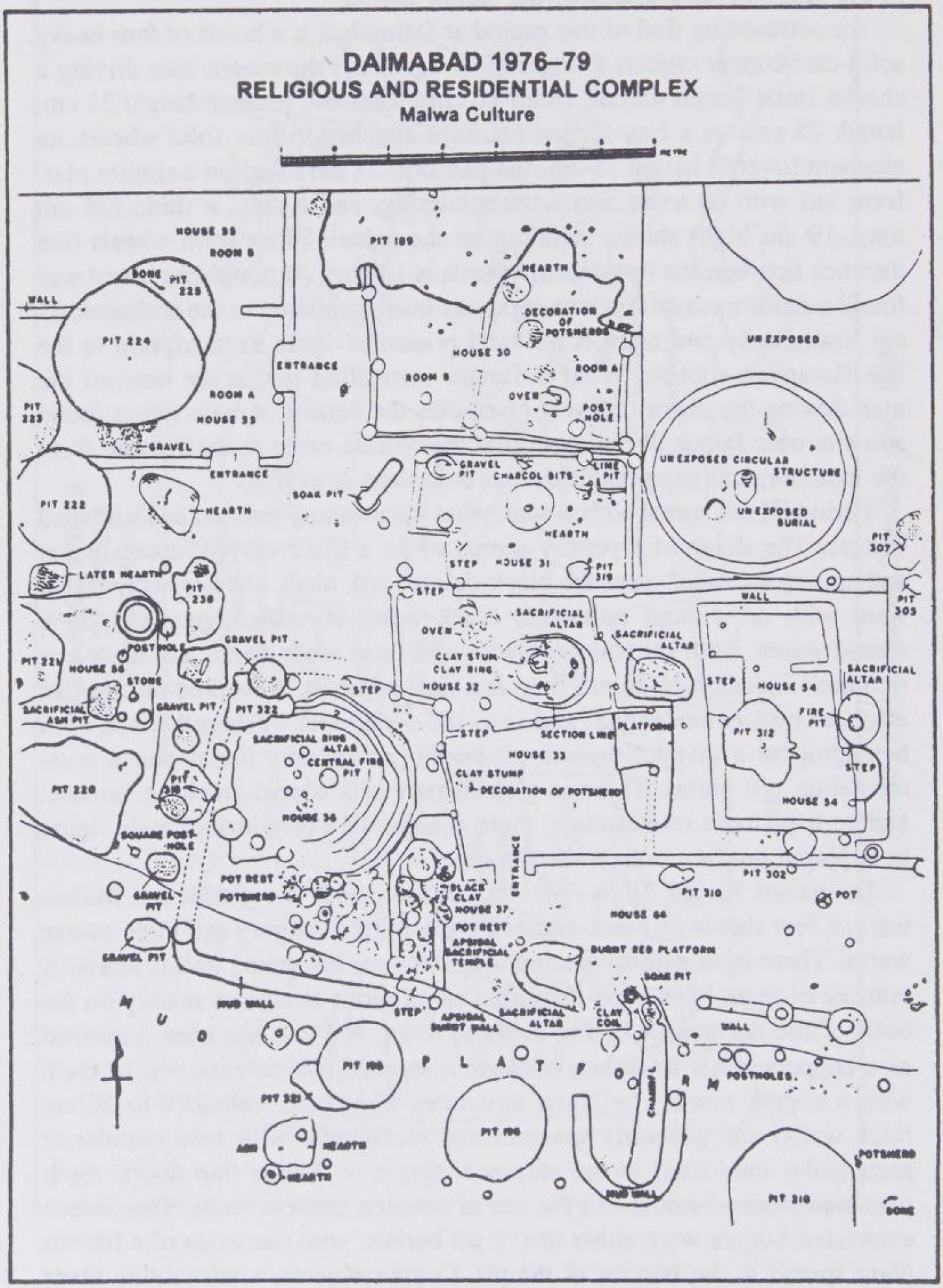



Fig. 31 Daimabad 'Malwa' houses (Sali, 1986)

objects complete the general cultural picture of this period. The earlier crops continued to be cultivated: barley, three kinds of wheat, ragi, lentil, a number of pulses, *ber/zizyphus* and a number of general plants, one of which—*sugandha bela* (*Pavonia odorata*)—could have been used in the perfumery. There were acacia and axlewood trees, along with the Indian laburnum tree (*Cassia fistula*) and the Indian rosewood tree (*Dalbergia latifolia*). A human figure is shown in applique on a piece of pottery. Its interpretation as Siva is difficult to accept just as it is difficult to accept the identification of an oval shaped stone with some designs as *ekamukhalinga* or one-faced representation of Siva. Out of a total of 377 beads, 283 came from a single burial. The use of paste or faience as bead material occurs for the first time during this period.

Period V at Daimabad is Jorwe culture, the most visible chalcolithic phase of Maharashtra (200-odd sites, according to a calculation) characterized by a black-painted red ware with a carinated bowl and a jar with tubular spout as its typical forms. The structural evidence becomes more elaborate in comparison with the Malwa cultural period and the settlement size now goes up to 30 ha, but the basic nature of the evidence does not differ, and many excavated houses are identified with different crafts: butcher's hut, lime-maker's house, potter's house, bead-maker's house, merchant's house, etc. One structure has been called an 'apsidal temple;' almost in the centre of its inner side was a fire-pit containing ash, 30 subangular pieces of stone with signs of burning and a çattle bone. A bastioned 1.3 to 2.4 m wide mud-fortification wall has been traced for 35 m. There are 48 burials, among which are 3 extended burials in a pit, 1 extended burial in urns and 44 urn burials. New types of millets—kodon millet, foxtail millet and jowar—appear in the crop list which otherwise continues as before. Copper objects, beads, terracotta objects, miscellaneous stone objects and microlithic blades continue to occur. An interesting find is a terracotta cylinder seal showing a horse-driven cart or chariot. The terracotta objects include some human representations as well, one of which has been identified—perhaps doubtfully—as a male sage with his consorts.

The skeletons unearthed at Daimabad belong, with one exception from the late Harappan context, to infants and minors. The most interesting feature perhaps is the presence of dental caries, gross enamel hypoplasia, tartar accumulations and calculus deposits in the teeth and that of a single case of ossified superosteal haemorrhage which represents a form of infantile scurvy.

Although Daimabad offers the complete protohistoric sequence of Maharashtra excluding Vidarbha, it is the epic scale of excavations and reporting from Inamgaon on the bank of the Ghor rive . ich has provided

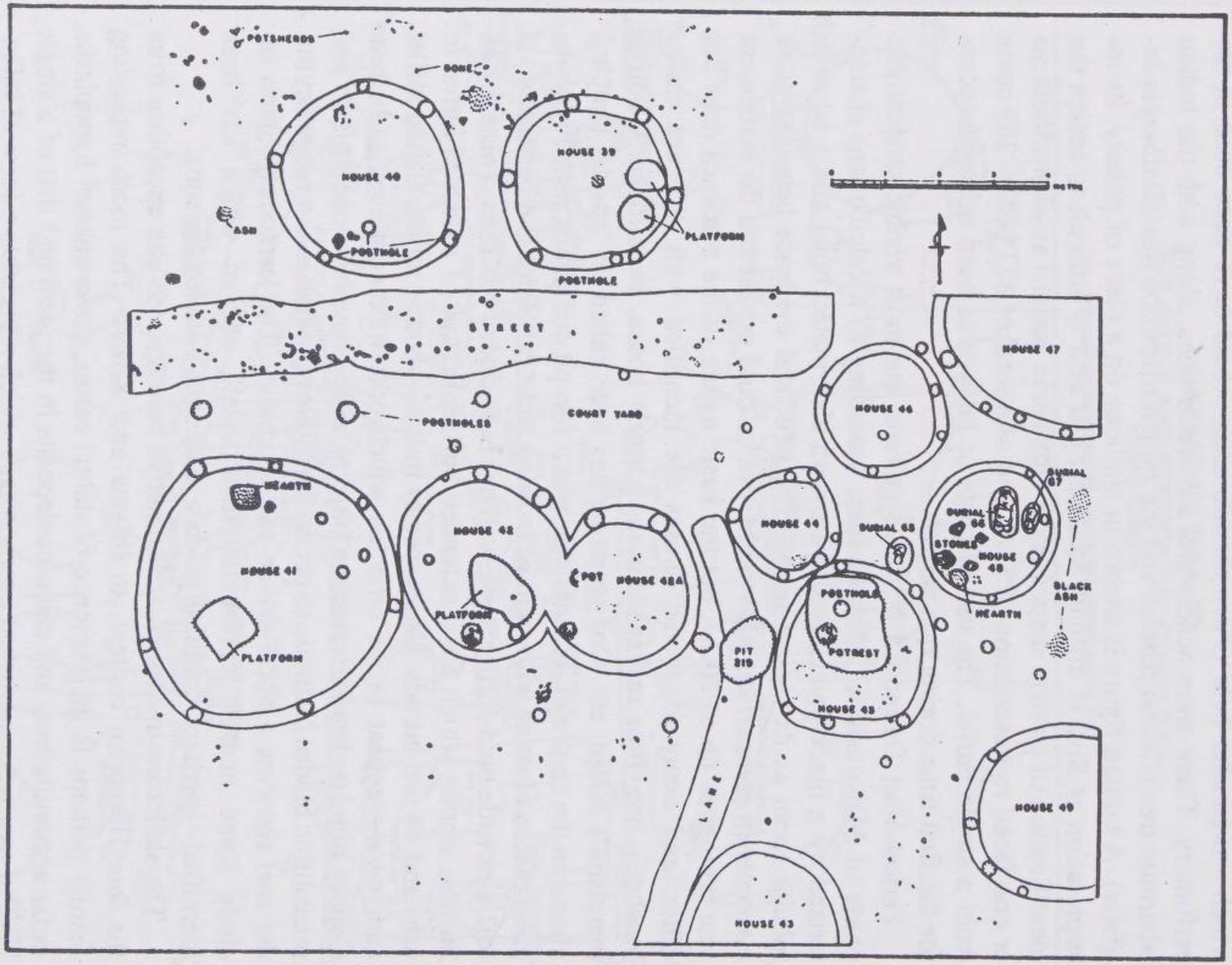



Fig. 32 Daimabad 'Jorwe' houses (Sali, 1986)

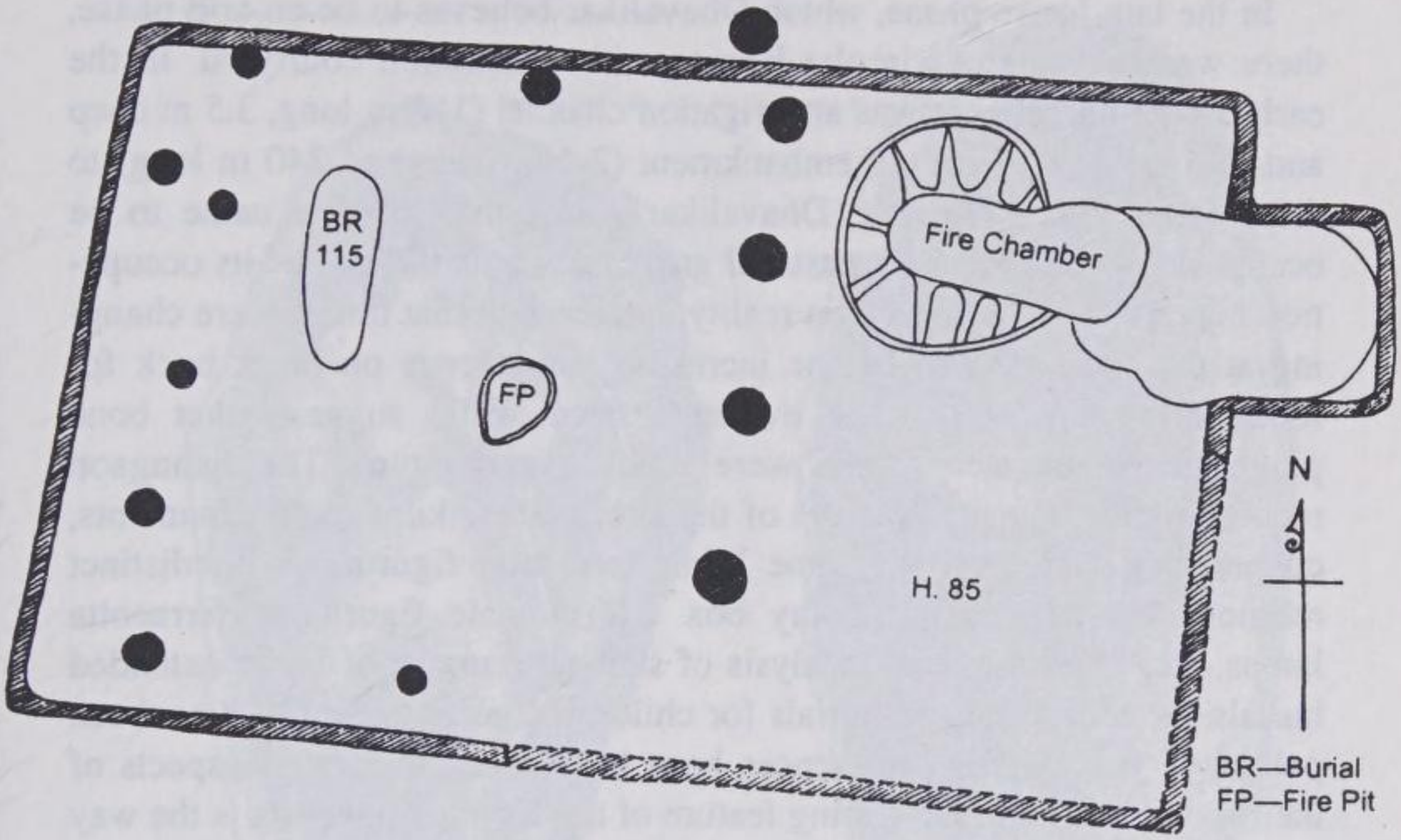



Fig. 33 House with pottery kiln, Inamgaon (Dhavalikar et al, 1988)

the most impressive detailed picture of the Jorwe cultural phase. The nature of distribution of Jorwe settlements seems to be clear: mostly 1 to 3 ha in extent, some being up to only 1 ha in extent and hypothetically related to a larger settlement in the vicinity by way of the presence of agriculturists from the main settlement for a part of the year at the small sites. The thatched wattle-and-daub houses of this phase at Inamgaon, which vary between $5 \times 3$ m and $7 \times 5$ m (the larger ones divided by partition walls), are best described in the words of Dhavalikar:

Inside the house would be a small oval fire pit, sometimes with high clay walls to serve as a protection from wind, whereas outside in the courtyard invariably we come across a large oval fire pit (1 by 0.5 m) which was probably used for roasting hunted animals. Almost every fire pit has a flat stone in the centre at the bottom, which was daubed with mud to serve as a support for the cooking vessel. Very often inside, but rarely outside also, there was a pit silo, 1 to 2 m in dia. and equally deep, and lined with lime for storing grain. In addition there was a round mud platform, with 1.5 m dia. and 10 cm high, which served to support a storage bin. The house floor was made of rammed clay with silt and fine sand spread in layers alternately and even the courtyard was well made. The domesticated animals, sheep/goat and cattle, were tethered in the courtyard as indicated by the nitrogen content of the soil.

In the late Jorwe phase, which Dhavalikar believes to be an arid phase, there were clusters of circular houses with a common courtyard. In the early Jorwe phase there was an irrigation channel (118 m long, 3.5 m deep and 4 m wide) with a mud embankment (2.4 m wide and 240 m long) to the west of the settlement. Dhavalikar's idea that the site came to be occupied by semi-nomadic pastoral groups towards the end of its occupation may not be quite based on reality, but the fact that things were changing at the site is shown by the increased dependence on black buck for food during this stage. The evidence from Walki suggests that bone ploughshares and seed drills were used in agriculture. The Inamgaon reports highlight many features of the site: pottery kilns, gold ornaments, copper slag and crucibles, lime kilns, terracotta figurines with distinct religious connotations (cf. clay box with female figurines), terracotta lamps, etc. The theoretical analysis of skeletal remains of many extended burials for adults and urn burials for children does not seem to have been published yet, although references have been made to various aspects of their tooth decay. An interesting feature of the Inamgaon reports is the way in which the political stage of 'chiefdom' has been inferred in the context of Jorwe cultural phase mainly because of a two-tiered settlement hierarchy and the existence in a five-roomed structure of a four-legged anthropomorphic clay jar containing the skeleton of an adult male whose body was originally placed in a sitting posture with the feet intact. The Inamgaon report is a gold mine of information of various sorts (cf. consumption of dog meat) which could only be fleetingly considered in the present context. What may be of some interest is the occurrence of a Ganeshwar-type copper arrowhead in the late Jorwe phase and that of a single spiralled copper pin in the early Jorwe phase at Inamgaon. The calibrated range of the late Jorwe at the site is the second half of the second millennium BC. The evidence from Nevasa and Chandoli indicates that both tin and lead alloying were practised in the Maharashtra chalcolithic which also knew the use of flax (cf. Chandoli).

The development in the Vidarbha region of Maharashtra is somewhat clouded by the large number of excavations of cairn-burial sites such as Junapani–Mahurjhari, Takalghat–Khapa where megalithic black-and-red pottery, iron and copper objects, decorative pieces and horse burials date from *c.* 700/800 BC. Takalghat is a habitation site of this context, and here we notice a few pieces of black-painted red pottery as well. In fact, these pottery pieces may link such sites to the sequence established at places like Tuljapur Garhi, Bhawar, etc. The Tuljapur Garhi sequence in Amaravati district is straightforward: the Malwa level is succeeded by the Jorwe level. What is interesting about the Jorwe level of this region is the occurrence

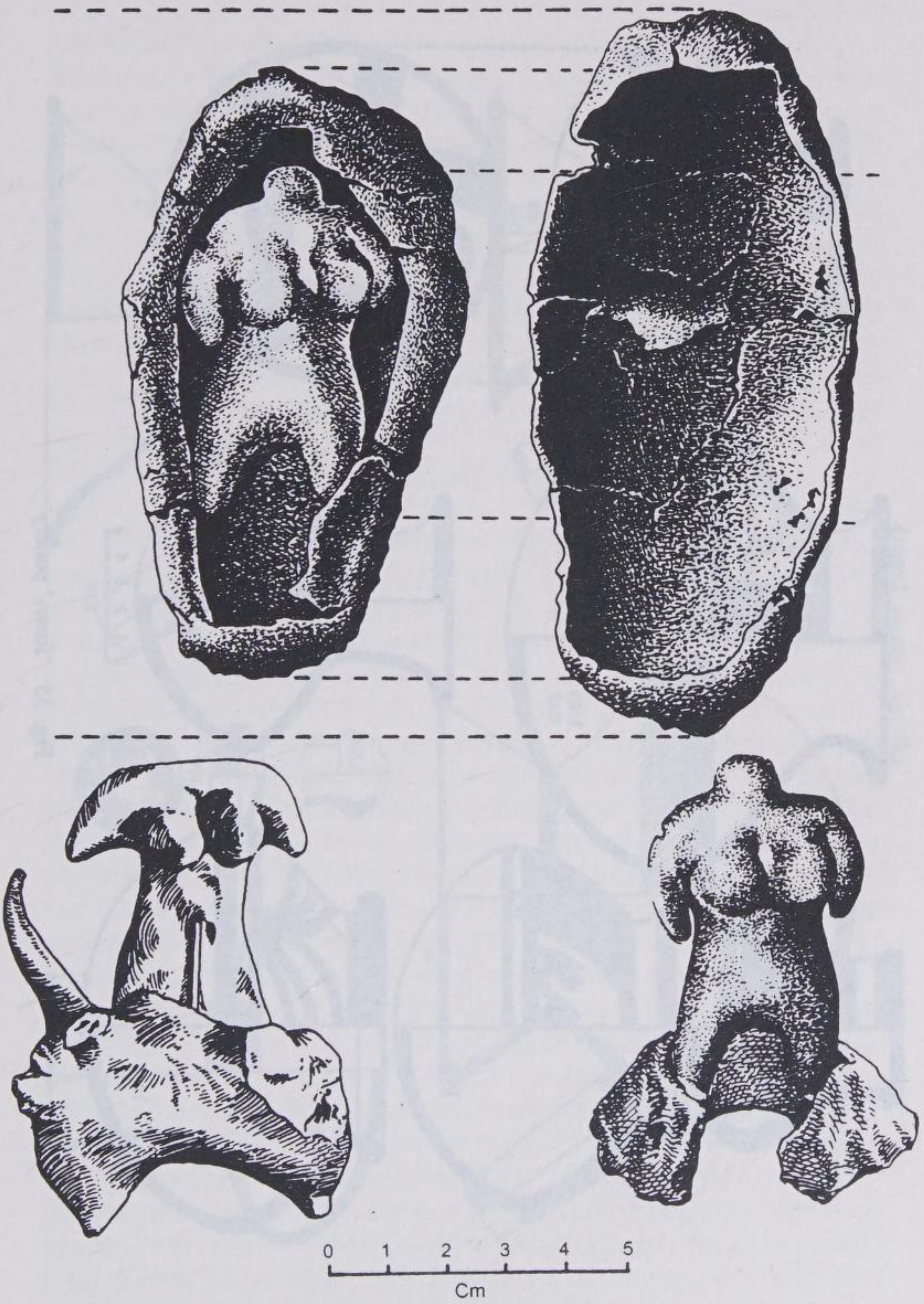



Fig. 34 Religious terracottas from Inamgaon (Dhavalikar et al., 1988)

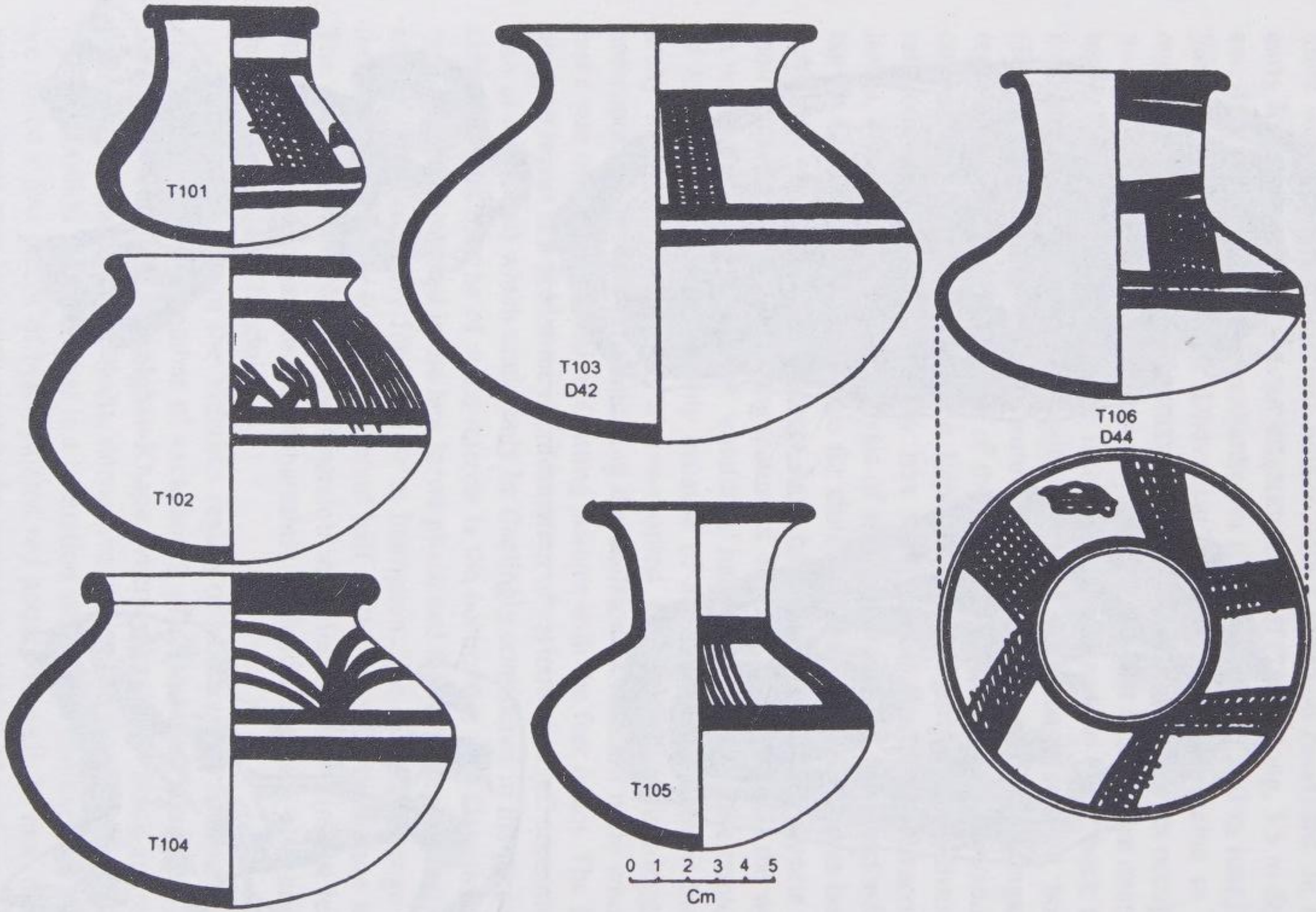



Fig. 35 'Jorwe' pottery

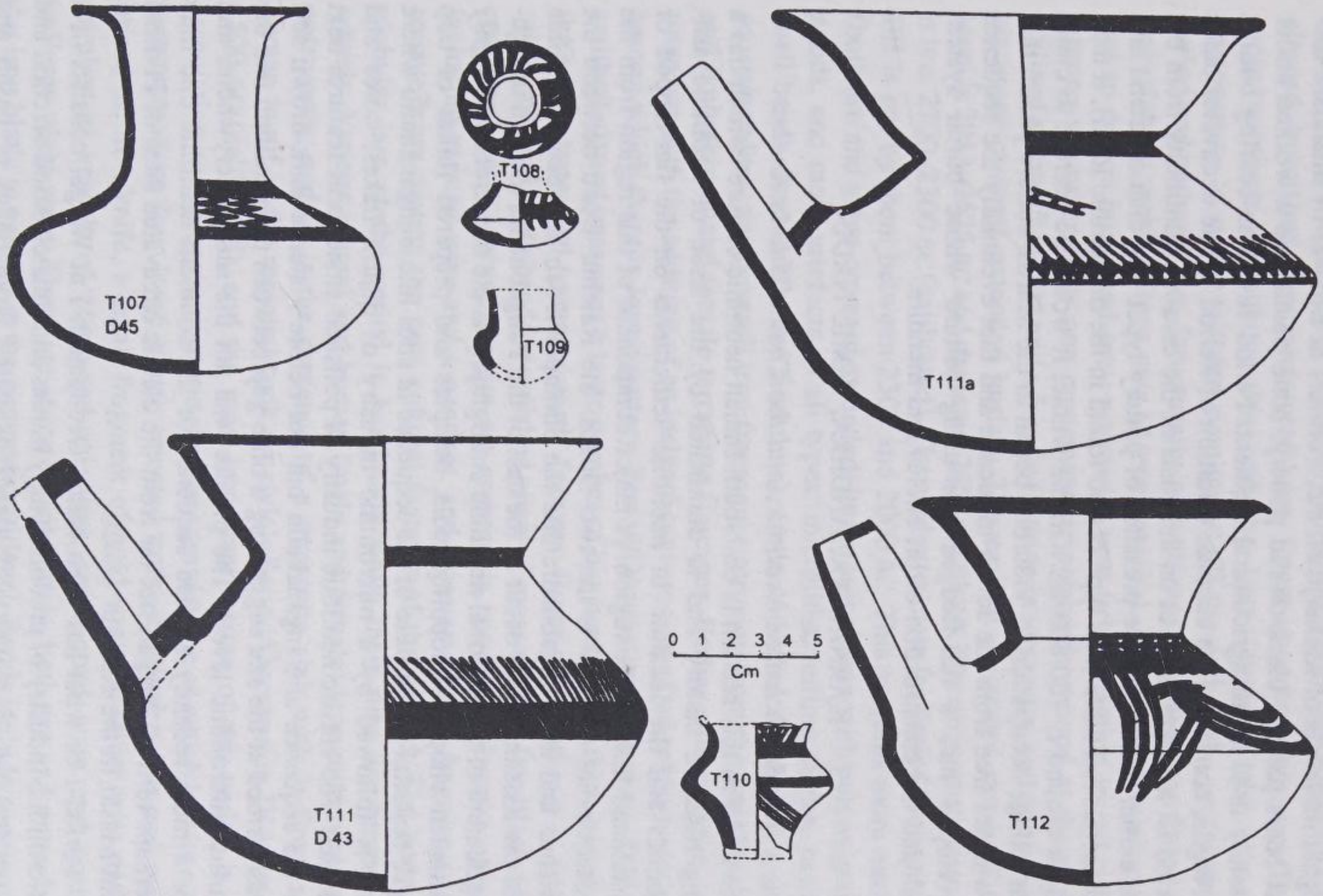



Fig. 36 'Jorwe' pottery

of black-and-red ware and etched carnelian beads which also occur in the megalithic levels of Mahurjhari, etc. Period I at Bhawar in Bhandara district bears painted black-on-red pottery, bone points and a worked antler possibly used as an agricultural element. Period II is iron-bearing but, as at Nagda, continues the ceramic tradition of Period I. The excavator dates Period III as Mauryan, but on the basis of the ceramic continuity from the two earlier levels and the presence of pottery types like dish-on-stand and micaceous red ware (this type is also found in the megalithic level), it may be put around *c.* 700/800 BC. On the whole, it would be correct to claim that village occupation in Vidarbha began in the Malwa culture phase, that it was not free from the Jorwe influence and that eventually the sequence developed into a full-fledged iron-using culture whose burial system included the construction of pit circles and menhirs.

## KARNATAKA, ANDHRA, TAMIL NADU[8]

### *The South Indian Neolithic, and the Chalcolithic in Andhra*

The focus in this section is on 'south Indian neolithic culture' which has a long research history and is dominated by the issue of neolithic ash-mounds and the location of neolithic settlements on the flat-topped or castellated hills of the region. A major component of this region from the present point of view is the two Doabs: the Raichur Doab between the Krishna and the Tungabhadra and the Shorapur Doab between the Bhima and the Krishna. Sites occur to the east of the Tungabhadra too. An intriguing feature of the regional neolithic stratigraphy is the occurrence of highly patinated chopper–chopping tools, scrapers and prepared flakes of trap dyke material at the base of the sequence at sites like Sanganakallu where this is followed by a microlithic industry of quartz flakes, cores and lunates. The classic neolithic industry of polished stone tools features next in the sequence at Sanganakallu but not before a sterile dark-brown soil was formed at the site suggesting a time-gap between the neolithic and the earlier microlithic levels. The picture was not the same everywhere, and for a more recently studied sequence of the southern neolithic one may perhaps turn to Watgal, not far from the classic excavated sites of Piklihal and Maski in the Raichur Doab.

Period I or what has been called Occupation I at Watgal consists of a microlithic industry of predominantly blades and lunates based on chert and quartzite and an industry of highly patinated large flakes of basalt and dolerite. Nothing else is found. Period/Occupation IIA shows the microlithic industry which is based exclusively on chert. Dolerite flakes exist and suggest the preparation of polished stone implements. The pottery is handmade,

with the possibility of some being produced on slow wheel. It is ill-fired (open kilns?) and basically coarse grey/red plain with sub-types like red-slipped, burnished grey, perforated base, finger-impressed rim, etc. These types continue throughout this and the later levels of the site and demonstrate 'a strong cultural continuity' till the end of the protohistoric period and perhaps later. Structurally, only storage pits have been found and one of them yielded areca nuts (*Areca catechu*). Marine shell beads occur and so does a burnished grey ware with post-firing painting in red ochre. Among the other finds one may mention potsherds ground at the edges, stylized animal figurines and a female figurine in terracotta, and one urn and six stone-covered extended burials. The earliest calibrated range of this level is 2913–2625 BC and the latest 2454–2281 BC. The excavators' date for it is *c.* 2700–2300 BC (calibrated). The calibrated date for Period/Occupation IIB is put by them between 2300 and 2000 BC. This contains more burials (both urn and stone-covered extended) but in association with pots as grave-goods, and more artefacts of all types: microliths, milling stones, marine shell beads, steatite (for the first time), stone and terracotta beads, a shell scoop/pendant, a very small iron fragment (intrusion from the later levels?) and both animal and female terracotta figurines. Earlier pottery types continue but with the addition of an insignificant amount of wheelmade pottery among which there is Jorwe pottery. Period/Occupation III is post-2000 BC (calibrated) and possesses a large number of big storage pits, three burials of the earlier types and 'rammed earth' features. Horse gram and ragi or finger millet, banded agate beads, a polished piece of moss agate, a few black-and-red ware sherds, carved steatite ear ornaments, six copper/bronze objects including twisted wire and a pendant, and three small iron fragments (intrusive?) are among the new cultural features of this period. The body of globular jars of the period is handmade while their rims are turned on wheels. Various animal and human (male and female) terracotta types are noteworthy and so is the presence of a terracotta slab with 'a fired, red human motif in the regional rock art style'. Period/Occupation IV is post-1500 BC (calibrated), and the most important feature of this period is its association with megalithic stone chamber graves, one of which had its contents spread on four large stones oriented to the cardinal points and comprised an iron knife, a small fragment of gold-wrapped silver wire and a number of vessels of black-and-red ware, red-slipped ware and coarse red/grey plain ware. There are seven infant burials, both urn and extended. An iron blade is present in the occupational level. Beads include specimens made of lapis lazuli, dolerite and copper/bronze, along with a lesser number of specimens made of marine shell. Terracotta figurines continue to occur but in a lesser quantity.

If Watgal has provided a recent sequence of the south Indian neolithic stratigraphy, Budihal in the Shorapur doab has provided more of the general neolithic cultural picture. Four distinct habitation localities have been identified here, in addition to a 4.5 ha area of chert blade-manufacturing workshop from which finished products could be sent elsewhere in the region. Locality I covers *c.* 1.8 ha and includes a residential area and a separate ash deposit area covering 0.5 ha in the centre of the locality. Further, within the ash-bearing section there is a cattle-penning area on the east and a cow dung disposal area on the west. The residential structures had low walls of stone blocks set in mud mortar. This area also contained a platform for chert working and a storage place for pottery. Ten child burials (urn and extended) were also found here. The general range of cultural material included red/grey pottery, polished stone tool industry, microlithic industry, a small number of bone tools, and beads of shell, bone and semi-precious stones. Horse gram and fruit stones of wild ber, cherry and 'emblic myrobalan' have been found along with domestic cattle, sheep, goat and fowl. Fish, crabs and molluscs occur and the wild fauna comprise basically deer and tortoise. An important discovery of the Budihal excavations is that of a floor with several stone blocks, which was earmarked for butchering mainly cattle and to a lesser extent, sheep, goat, buffalo and deer. The calibrated BC range of Budihal is *c.* 2400–2100.

The chalcolithic phase after the model of Maharashtra and Madhya Pradesh occurs in Andhra at a large number of sites, among which Singanapalli and Ramapuram (both in the Kurnool area) are the important excavated ones. A profuse quantity of painted wheelmade pottery (usually black-on-red with channel-spouted bowls as a distinctive shape), microlithic industry, lime-plastered house-floors, beads of semi-precious stones, etc. constitute the average cultural features. The excavations are only briefly reported. The beginning of this phase, if the calibrated range of a date from Ramapuram (2455–2041 BC) is indicative, may be earlier than *c.* 2000 BC.

### *The Megalithic Complex*

The area between the Vidarbha region of Maharashtra and the tip of the southern peninsula constitutes the major zone of the burial style denoted by various types of megaliths. This burial style continued well into the historical period in its main distribution area and is characterized by a host of megalithic structures such as cairn-circles, dolmen, menhirs, etc. and their extensive variations and combinations. Till recently, megaliths were supposed—quite wrongly—to have formed an independent cultural entity in this region. However, it is now clear, especially after the excavations of

sites like Watgal in Karnataka and Bhawar in Vidarbha, that it is nothing more than a burial style which emerged in the context of the neolithic–chalcolithic of its distribution area and formed part of its cultural milieu for a long time. Generally, it is associated with iron but there is also a possibility of its beginning in the pre-iron stage. At sites such as Hallur and Kumaranahalli, its first iron-associated phase falls around 1300 BC (calibrated).

## ORISSA, THE NORTH-EASTERN STATES, WEST BENGAL AND BIHAR[9]

### *Orissa*

We have earlier noted the existence of a neolithic level at Kuchai near Mayurbhanj in Orissa. Because this level appears at the end of a long and continuous prehistoric sequence in the region, there is a possibility that this level is fairly early. Further, the occurrence of domesticated rice in a site (Baidipur) of the same type in this area makes the issue interesting. However, the unconfirmed report of a thermoluminescent date of *c.* 1000 BC for pottery from this level at Kuchai is not inspiring, and when one considers *c.* 800 BC (calibrated) date of neolithic celts associated with copper implements at Sankarjang in Dhenkanal, one cannot view a date of *c.* 1000 BC for the Orissan neolithic particularly surprising. There is no dearth of the surface occurrence of polished neolithic tools in Orissa, and apparently large-scale manufacturing places have been noted in several areas, but dates and stratigraphy remain a serious problem both for the neolithic and the chalcolithic in Orissa. As far as the chalcolithic is concerned, sites bearing black-and-red ware are known, but it is difficult to say if this black-and-red ware is the chalcolithic black-and-red ware of a type which has been found widely in the second millennium BC context in the neighbouring states of Madhya Pradesh, Andhra and West Bengal.

The excavations (1990–92) at Golbai Sasan on the left bank of the Mandakini river (a tributary of the Daya flowing into the Chilka coastal lake) seem to have changed this picture of uncertainty regarding the neolithic–chalcolithic in Orissa. Period I at the site is neolithic and shows a range of dull red and grey handmade pottery with cord or tortoise shell impressions in association with a few worked pieces of bone and traces of floors and post-holes.The excavated area of this period was very limited in extent. Period IIA is chalcolithic because it has yielded, in addition to polished stone and bone tools, copper objects such as chisel, bangle, fish-hook and ring. The polished stone industry comprised axes, adzes, shouldered celts, bone tools, single-row harpoons and spears. The find of

an adze made of a wide piece of semi-mineralized bone is also noteworthy. Among the other bone objects one notes earstuds and pendants. The pottery was mainly handmade and partly wheelmade, including terracotta crucibles, unpainted black-and-red ware, dull red ware, and burnished black, chocolate and red wares. The burnished chocolate ware pots show in some cases post-firing paintings (oblique and vertical strokes and hatched triangles) in red ochre. The shapes include dish-on-stand as a type. Circular huts (3.9 to 7.9 m in diameter) with post-holes and hearths have been found in this level. Other objects comprised terracotta spindle-whorls, sling balls and a crude human figurine. Period IIB continues the features of Period IIA but shows an iron tool resembling a polished stone celt in shape. Cattle, goat, deer and elephant figure among the faunal records, and rice, 'moong' and 'kulthi' have been noted among the crop remains of the periods IIA and IIB. There is no reason why these periods of Golbai Sasan should not cover together the whole of the second millennium BC and go back well into the third millennium BC.

### *The North-eastern States*

The entire north-eastern region has yielded a rich haul of polished neolithic tools but no consolidated picture of a neolithic level has yet emerged. In Assam, two neolithic sites—Daojali Hading in the north Kachhar hills and Sarutaru on the border between Assam and Meghalaya—were excavated some years ago. The 45 cm thick occupation deposit at Daojali Hading revealed neolithic stone and fossilwood axes, adzes, hoes, chisels, grinding slabs, querns, mullers, handmade grey to dull red cord-marked pottery, dull red stamped pottery and plain red pottery. Sarutaru has revealed only brown/buff/grey handmade ware, some of which bears cord marks. Otherwise the cultural assemblage is the same. Unfortunately these sites are not dated. More recently, several places in Nagaland have yielded both handmade grey ware and neolithic tools but these sites are still unexcavated. However, the mere existence of neolithic tools and handmade grey ware does not mean that these sites are early in date. The 'neolithic culture' in the Kanai Goan Reserve in Dibrugarh district has yielded a date in the sixth century AD. In view of the uncertainty of evidence it is also difficult to accept the claim of a Hoabinhian level at the base of a neolithic cultural layer in a pit dug at Rongram Alagiri in the Garo hills. The basis of this claim is the occurrence of pebble unifacial tools associated with heavy stone pounders in the pre-neolithic level of the site. A trial trench at Pynthorlangtein in Meghalaya showed 1 m deposit of neolithic tools and the waste product in association with handmade cord-impressed red pottery. The only early date of handmade cord-marked ware in the entire

north-east is a thermoluminescent date of 1650 ± 350 BC from the site of Napchik located on a hillslope in Manipur. Handmade tripod vessels, stone choppers, scrapers, flakes, edged ground knife, grinding stone, polished celts, etc. constitute the general assemblage of the site. It thus appears that a lot more about the neolithic stage in the north-east is still waiting to be discovered.

### *West Bengal*

The chalcolithic level in West Bengal is clearly marked, but its antecedence, if any, in this area is as yet unknown except at the site of Pandu Rajar Dhibi where Period I does not seem to be associated with copper and is characterized by a handmade grey ware with rice husk impressions, painted red pottery, a limited quantity of black-and-red ware, ground stone tools, microliths and bone tools. The absence of metal may also be due to the limited excavations of this level. The dominant pottery of Period II is white-painted black-and-red ware with bowls and carinated vessels as its principal shapes. Channel-spouted bowls of black-and-red ware occur in a limited number. The associated pottery types are a rich red-slipped black-painted pottery, black-slipped pottery and a buff/grey plain pottery. The painted designs occur on black-and-red, red and chocolate-slipped wares (mostly on red, with a much lesser proportion in black-and-red and chocolate-slipped types) and comprise about 15 major types with sub-types, among which triangles, band, comb and ladder designs are important. Bone implements, a limited quantity of copper objects, beads of semi-precious stones, terracotta female figurines, a fragmentary piece of lapis lazuli and iron spearheads and points have been recovered from this period. Regarding the occurrence of iron objects in this period it has been said that 'they have mostly been found from the upper levels, though their occurrence in the lower levels was also noticed.' Periods III and IV continue these features till one gets early historic pottery in Period V. Period I seems to date from the 15th century calibrated BC whereas Period II seems to fall in the 12th century calibrated BC.

Pandu Rajar Dhibi in the Ajay valley is the first such site to have been excavated in West Bengal. Bharatpur in the Damodar valley yielded in its Period I microliths, tiny neolithic celts, bone tools, steatite beads and copper objects in association with a predominantly black-and-red pottery. The earliest date range of Bharatpur Period I is 1735–1417 BC (calibrated). Its Period II is early historical. Mahisdal in the Kopai valley showed in its Period I house-floors with soling of terracotta nodules, prolific bone and microlithic tools, a single flat celt of copper, steatite and semi-precious stone beads, terracotta bangles, decorated combs and a terracotta phallus,

apart from the usual black-and-red ware and associated pottery range. A storage pit with a large quantity of charred rice grains was found in this level. The rice grains belonged to a fine variety. Period II at the site possessed all the earlier features but also contained iron arrowheads, spearheads, chisels and large quantities of iron ore. Another find was an unburnt clay seal with indeterminate symbols on the obverse and impressions of cross strings on the reverse. The earliest calibrated date range of Mahisdal Period I is 1619–1415 BC. Rammed house floors of wattle-and-daub houses, bone tools, the usual range of black-and-red ware and associated pottery, a limited quantity of microlithic flakes and pieces of iron slag occur in Period I of Bahiri in the Ajay valley, dated in the calibrated range of 1112–803 BC and later. In addition to the usual pottery types, the cultural assemblage of Period I of Mangalkot in the Ajay valley comprised wattle-and-daub houses with mud floors plastered with cowdung and occasionally rammed with potsherds and granular gravels, stylized human terracotta figures, terracotta beads, netsinkers, bangles, sling balls, discs, beads of semi-precious stones, limited number of microliths, prolific and diverse bone tools, copper spiral bangles and fishhooks and iron slag, bloom, point, spearhead and knife. The date is in the range of Period I at Bahiri.

As in the Deccan, burials (both extended and urn types) have been located within the habitations but it appears that they were generally found in fragmentary conditions. A general report is available only on one such skeleton (from Kurmitha in the Kopai valley). The skeleton which belonged to a female aged 50 (height 155 cm) was oriented in a north–south direction with the arms flexed at the elbow. It belonged to the medium-sized head category (cranial index : 77.38) and the extent of the dental wear 'is reflective of a higher content of siliceous and carbohydrate vegetarian stuffs in the diet of the person'. The cranial index of Pandu Rajar Dhibi and Haraipur skeletal finds is said to belong to the long-headed type. The faunal remains from such West Bengal sites have been well studied. Domesticated cattle, buffalo, goat and pig occur at Pandu Rajar Dhibi which also shows hog deer and sambar (*Cervus duvauceli*), fish (mostly large carps), turtles and fowl. The list of faunal remains at Baneshwar Danga is also more or less the same. About 10 per cent tin alloying has been noticed in a piece of copper wire at Bahiri.

There are 70-odd reported chalcolithic and Iron Age black-and-red ware sites in West Bengal. What is interesting is that, with the exception of Bangarh in the Barind plain of the northern part of the state, which shows only a piece of this pottery on the surface, they are distributed mostly in the area to the west of the Bhagirathi. The river valleys are, from the north to the south, Dwaraka, Mayurakshi, Bakreshwar, Kopai, Ajay, Damodar,

Dwarakeshwar, Silai and Kasai and their smaller tributaries, all flowing through a sloping plateau region from the west to the east towards the Bhagirathi. A study of their individual locations suggests that some of the sites in the western part of the state were located in agriculturally less attractive areas and were perhaps geared towards the raw material resources of the main part of the Chhotanagpur plateau. Otherwise, the overall preference was for the fertile stretches along rivers and for a general nearness to low-lying lands. Further, the gravelly iron-rich lateritic uplands within the distribution area of these sites would have taken care of the problem of getting iron ores, and to some extent the various types of rocks—mainly chert and quartz—used by them, because of the general abundance of rocky outcrops within the distribution area itself. However, materials like copper and tin had to be brought from the main Chhotanagpur plateau which is some distance away. The copper belt of Singhbhum–Hazaribagh in this plateau section of Bihar must have been the primary source of copper, although the outliers of this belt in the adjacent West Bengal district of Bankura could have played a part too. The source of tin was Hazaribagh–Giridih, some 300 km away from sites like Bahiri and Mangalkot where tin has been reported in the black-and-red ware context. We have also suggested that in the absence of the manufacture of polished stone celts at these sites, it is possible that such celts were traded items too. The general range of site-size is from below 1 acre to about 8 to 9 acres, with most of them falling in the lower bracket.

### *Bihar*

South Bihar comprises mostly the Chhotanagpur plateau which has a long prehistoric sequence. Whether this sequence led to an early neolithic or farming community level is not known. There is no dearth of neolithic celts in certain areas of the plateau (cf. the Santal Parganas) but no corresponding site has been found and excavated. The first archaeologically identifiable village level in the plateau is represented at Barudih in Singhbhum district. This site contains in the same level microliths, neolithic celts, iron slag and implements and a range of wheelmade pottery among which black-and-red ware seems to be prominent. There are four radiocarbon dates from the site and the earliest calibrated range is 1401–837 BC.. No authentic neolithic site has yet been discovered in the Chhotanagpur plateau. This is surprising, especially in view of the apparently wide occurrence of neolithic level in the alluvial plains of northern Bihar where five sites—Chirand, Chechar-Kutubpur, Senuar, Maner and Taradih—are already excavated. Chirand has an about 1 km long mound at the confluence of the Sarayu and the Ganga. Chechar-

Kutubpur lies on the bank of the Ganga near Biddupur on the opposite side of Patna while Senuar lies on the bank of a stream in a fertile plain at the foot of the Kaimur range not far from Sasaram. Maner lies on the bank of an old course of the Ganga near Patna and Taradih is basically Bodh Gaya, within a stone's throw of the Mahabodhi temple. Basically they are all riverbank sites, and the fact that they comfortably formed viliages in such widely spaced areas as Bodh Gaya and Chirand and that too straight on the banks of major rivers like the Ganga (cf. Maner, Chechar-Kutubpur and Chirand) in the third millennium BC suggests that much more remains to be known about the formation of these neolithic sites in the Bihar plains. Dates are available from Chirand and Senuar, both being considerably earlier than *c.* 2000 BC (calibrated). The dates do not come from the lowest levels of these sites; in the case of Chirand, the level from which the first date comes is much above the lowest level of its 3.5 m thick neolithic deposit. The beginning of occupation at Chirand may even be earlier than the middle of the third millennium BC.

The basic pottery types of Period I or the neolithic deposit of Chirand comprise red, grey and black handmade wares (some with post-firing painting and graffiti). There are also examples of black-and-red ware. The dominant type, however, is the red ware. The exterior of many grey pots bears burnishing whereas their interior remains unburnished. The types include footed cups, channel-spouted bowls and ordinary spouted bowls. Terracotta objects from this level include figurines of humped bull, birds, snakes, and bangles, beads, sling balls and objects decorated by punctured dots. There is a wide range of bone and antler implements and bone objects include pendants, ear-rings, discs, beads and bangles of both bone and ivory. There are neolithic axes and other implements. Stone pestles and querns have been found. There is also a rich microlithic industry. Beads are made of agate, carnelian, jasper, steatite, faience, etc. Circular wattle-and-daub huts with rammed floors (4 m in diameter), post-holes, hearths, etc. have been found and there is also a reference to the mud boundary walls of houses. Among the crops are rice, wheat, barley, moong and lentil and animal remains include a wide range from domesticated cattle to elephants and rhinoceros. Copper in any form is not reported from this level.

Period II of Chirand is chalcolithic in the sense that copper appears and the pottery becomes dominantly black-and-red ware and the associated types of grey/buff, black and red-slipped wares. Otherwise, the earlier features continue: microlithic tools, neolithic celts, terracotta beads (some with incised designs), steatite and semi-precious stone beads, stone balls, pestles and querns, etc. Its earliest calibrated date-range is 1936–1683 BC. The upper level of this period yielded numerous iron objects.

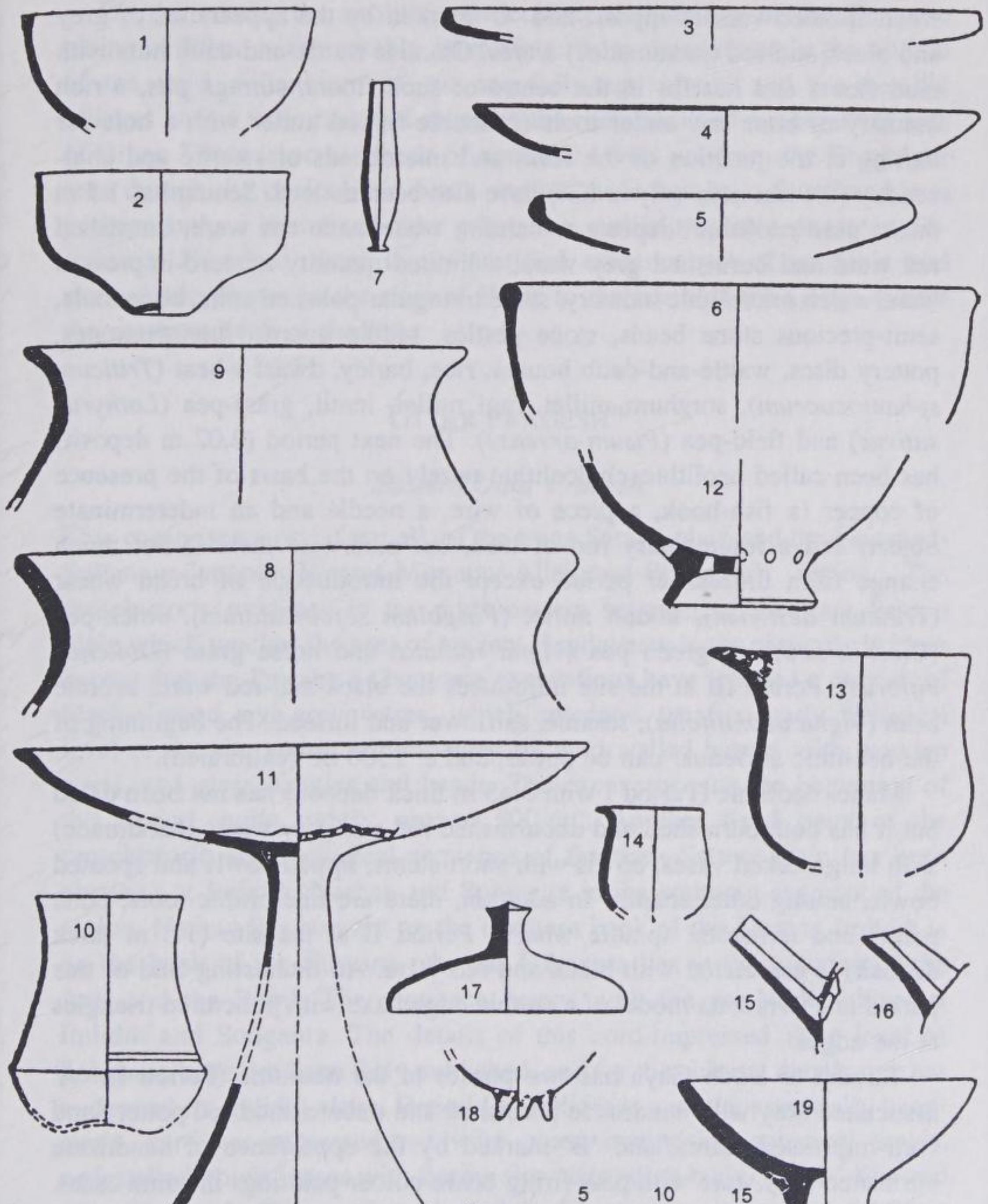



Fig. 37 Chirand pottery (*Indian Arch.—A Rev.*)

The neolithic level at Chechar-Kutubpur has three sub-periods: 'A' associated with handmade red and grey ware with 'twisted rope', 'pinched', 'applique' and 'cut pattern' designs on the shoulder of the vessels; 'B' when spouted vessels appear; and 'C' marked by the appearance of grey and black-and-red (handmade?) wares. Circular wattle-and-daub huts with mud floors and hearths in the centre of such floors, storage pits, a rich industry of bone and antler tools (a double-forked antler with a hole for hafting at the junction of the fork) and microbeads of steatite and chalcedony (the last item only in IC?) have also been noticed. Senuar has 1.5 m thick 'pure neolithic' deposit containing wheelmade red ware, burnished red ware and burnished grey ware, a limited quantity of cord-impressed ware, a rich microlithic industry, some triangular polished celts, bone tools, semi-precious stone beads, stone pestles, saddle querns, hammerstones, pottery discs, wattle-and-daub houses, rice, barley, dwarf wheat (*Triticum sphaerococcum*), sorghum millet, ragi millet, lentil, grass-pea (*Lathyrus sativus*) and field-pea (*Pisum arvense*). The next period (2.02 m deposit) has been called neolithic–chalcolithic purely on the basis of the presence of copper (a fish-hook, a piece of wire, a needle and an indeterminate object) and a fragmentary rod of lead, but otherwise there is not much change from the earlier period except the introduction of bread wheat (*Triticum aestivum*), kodon millet (*Paspalum scrobiculatum*), chick-pea (*Cicer arietinum*), green pea (*Vigna radiata*) and horse gram (*Dolichos biflorus*). Period III at the site introduces the black-and-red ware, aconite bean (*Vigna aconitifolia*), sesame, safflower and linseed. The beginning of the neolithic at Senuar can be put around *c.* 2300 BC (calibrated).

Maner neolithic (Period I with 3.45 m thick deposit) has not been dated but it has both burnished and unburnished red and grey wares (handmade) with long-necked vases, bowls with short stems, lipped bowls and spouted bowls, among other shapes. In addition, there are microlithic tools, bone points and terracotta spindle whorls. Period II at the site (1.8 m thick deposit) is associated with black-and-red ware. An interesting find of this period is a terracotta model of a double-edged axe with punctured triangles at the edges.

Taradih or Bodh Gaya has two phases of the neolithic (Period I): 'A' associated only with handmade burnished and unburnished red pottery and cord-impressed wares, and 'B' marked by the appearance of handmade burnished grey ware with post-firing ochre-colour paintings in some cases. Neolithic celts and microlithic and bone tools, bones of cattle, goat, pig, buffalo, sheep and deer, along with those of birds, fish, shell and snail, the remains of rice, wheat and barley, and wattle-and-daub house remains with traces of hearths constitute the general assemblage. Period II is chalcolithic

marked by the continuation of earlier elements and the introduction of black-and-red ware, a limited number of copper objects, lentil and a large quantity of semi-precious stone beads.

On the whole, the neolithic–chalcolithic assemblage of the Gangetic plains of Bihar is remarkably interesting: from approximately the middle of the third millennium BC we see fully agricultural and pre-metallic villages with a wide range of crops on the river banks of a substantial area of Bihar. There is no evidence of neolithic levels yet from the Bhagalpur area though the chalcolithic black-and-red ware has been found and it is perhaps only a matter of time when the earlier neolithic phase is discovered. However, there is no stratified evidence yet of neolithic and chalcolithic phases in the case of Bihar to the north of the Ganga except the northern bank of the river.

## UTTAR PRADESH[10]

### *Eastern Uttar Pradesh*

This comprises most, if not all, of the trans-Sarayu plain and the Faizabad-Sultanpur-Jaunpur-Banaras-Mirzapur-Allahabad-Pratapgarh region. The protohistoric evidence in the north-eastern segment of the trans-Sarayu plain which touches the area of ancient Kapilavastu is not particularly clear except that the Piprahwa-Ganwaria excavations have isolated a deposit of black-slipped and grey wares, which antedates the first early historical level of the site and is accompanied by mud-walled houses with wooden posts, and glass bangles and beads. The excavator puts the beginning of this period, quite rightly, around 800 BC. Another fixed point of the protohistoric archaeological sequence of the trans-Sarayu plain has been obtained at Imlidih, Narhan and Sohgaura in the southern segment of the region. Narhan lies straight on the northern bank of the Sarayu; Imlidih is on the bank of the Kuwana whereas Sohgaura lies at the junction of the Ami and the Rapti. The sequence begins with the pre-Narhan level at Imlidih and Sohgaura. The details of this cord-impressed ware level of Sohgaura have not been fully published, and for the cultural details one has to depend on Imlidih alone. Period I at Imlidih is a crude, essentially hand-made, cord/mat-impressed red ware phase comprising spherical bowls, pedestalled bowls, vases with flaring rim, expanding body, 'handi'-like and spouted vessels. Traces of wattle-and-daub houses, a storage pit of 1.95 m diameter and a circular bin-like structure (internal diameter 85 cm) have been identified along with a few steatite microbeads, beads of terracotta, agate and faience, bone points and pottery discs. Cattle, sheep/goat, pig (all

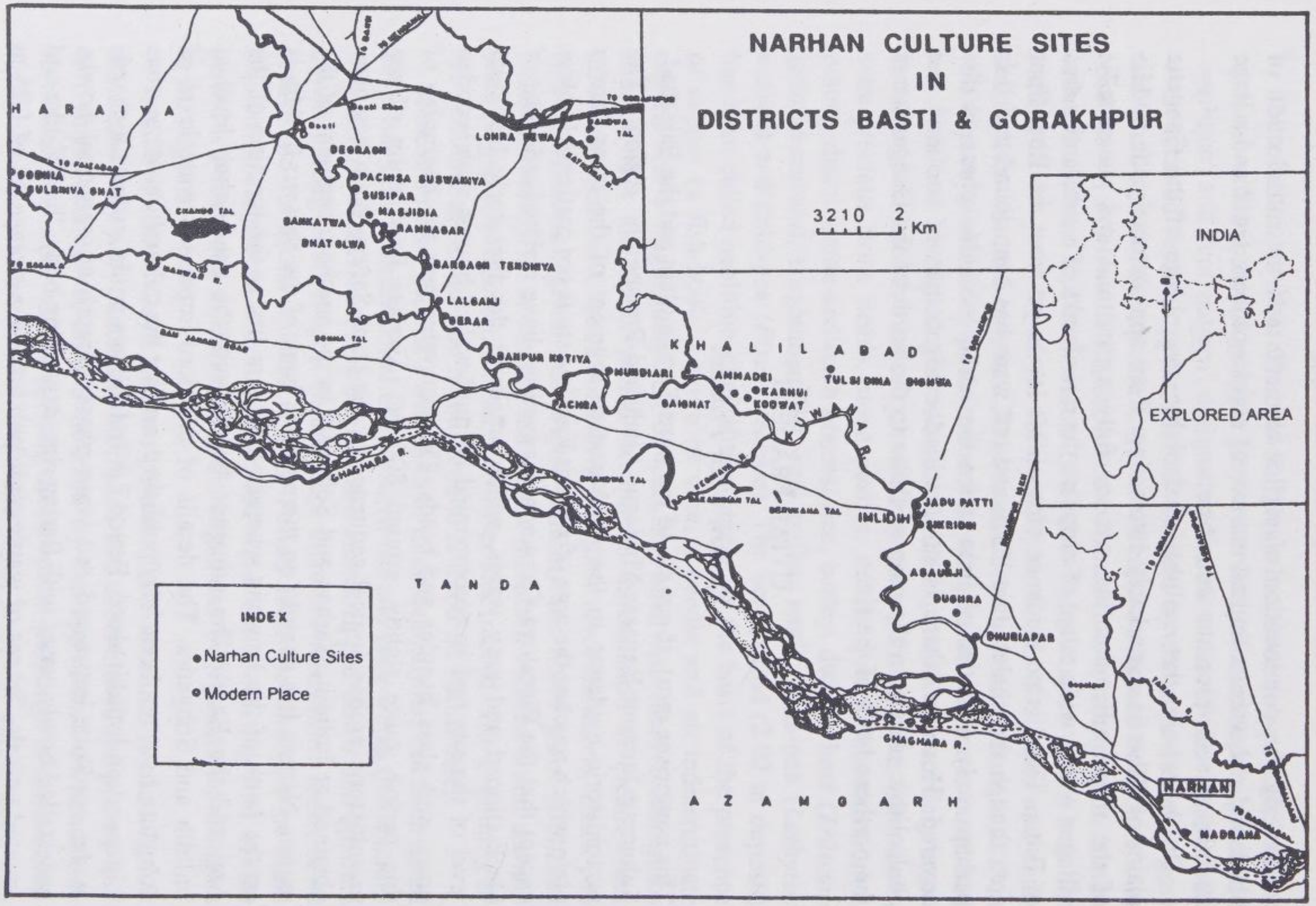



Fig. 38 Narhan culture sites (P. Singh, 1994)

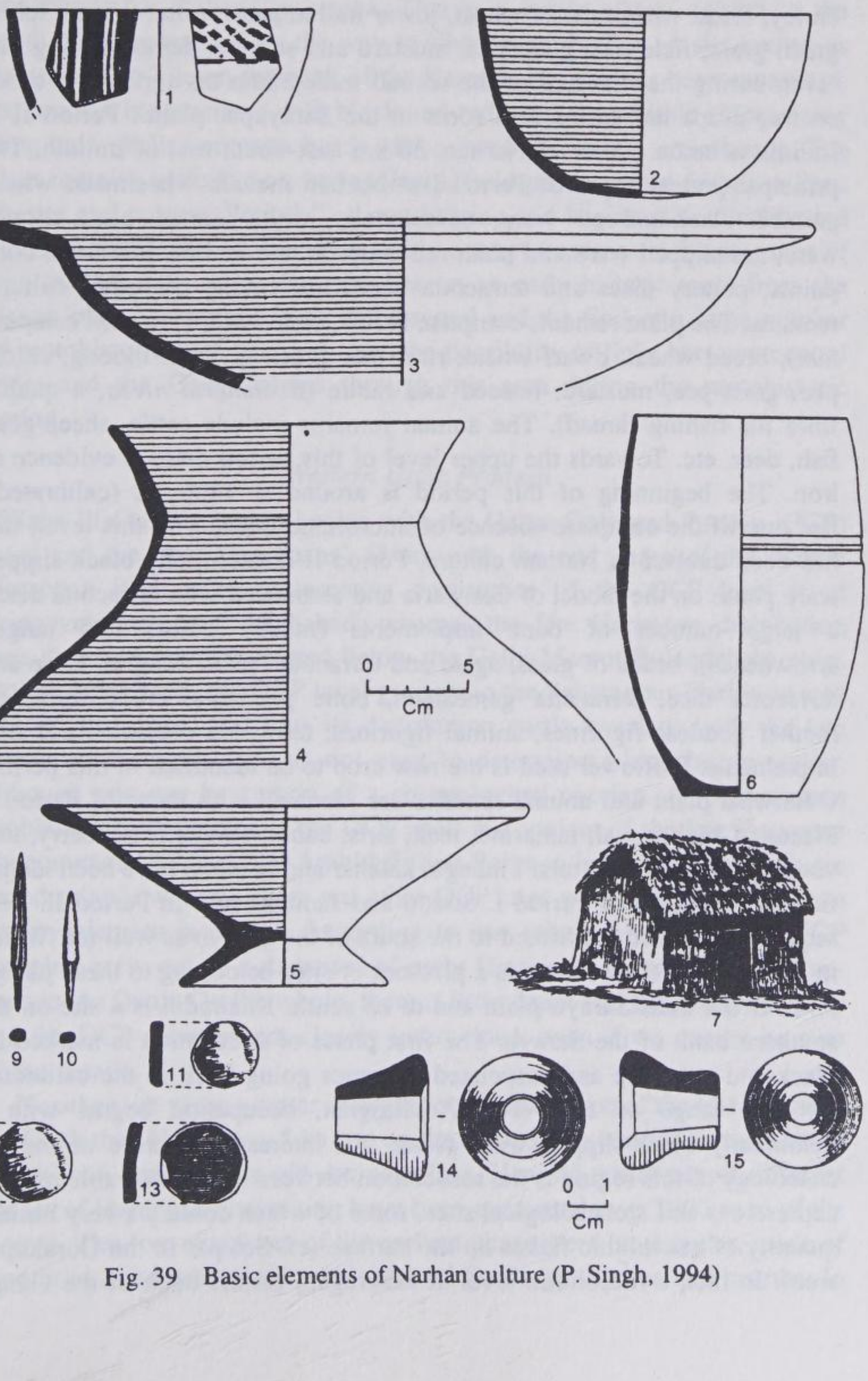



Fig. 39 Basic elements of Narhan culture (P. Singh, 1994)

domesticated), two species of fresh water turtle, fish and freshwater mollusca occur among animal bones. Cattle remains predominate and show butchery marks. The archaeobotanical remains of this period include rice, barley, bread wheat, dwarf wheat, jowar millet, pearl millet (bajra), lentil, green gram, field-pea, grass-pea, mustard and sesame, demonstrating that 'even during the first half of the second millennium BC agriculture based on two crops had taken firm roots in the Sarayupar plain'. Period II at Imlidih is better known at Narhan, 30 km east–south-east of Imlidih. The principal pottery types of Period I at Narhan include wheelmade white-painted black-and-red ware, occasionally white-painted black-slipped ware, red-slipped ware and plain red ware. Wattle-and-daub houses, bone points, pottery discs and terracotta beads are among the other cultural remains. The plant remains comprise barley, club wheat (*Triticum compactum*), bread wheat, dwarf wheat, rice, pea, green gram or moong, chick-pea, grass-pea, mustard, linseed and ramie (*Boehmeria nivea*, a quality fibre for fishing thread). The animal remains include cattle, sheep/goat, fish, deer, etc. Towards the upper level of this period there is evidence of iron. The beginning of this period is around *c.* 1400 BC (calibrated). Because of the complete absence of microlithic industry in this level, this has been dubbed as Narhan culture. Period II is essentially black-slipped ware phase on the model of Ganwaria and associated with terracotta discs, a large number of bone implements (mostly points and tanged arrowheads), beads of glass, agate and terracotta, glass bangles, bone and terracotta dice, terracotta gamesmen, bone pendants, crude terracotta mother goddess figurines, animal figurines, terracotta crucibles and iron implements. Safflower seed is the new crop to be identified in this period. Otherwise plant and animal remains are identical with those of Period I. Pieces of Mahua, sal, tamarind, teak, siris, babul, ganiyari, mulberry, nux vomica, holy basil or 'tulsi', mango, katahar and bamboo have been identified in the record of Period I. Sissoo and Jamun occur in Period II. This sequence has been confirmed to the south of the Sarayu as well (cf. Waina in Ballia district), and there is a plethora of sites belonging to these phases all over the trans-Sarayu plain and to its south. Khairadih is a site on the southern bank of the Sarayu. The first phase of occupation is marked by black-and-red ware and associated ceramics going back to the calibrated BC date range of 1395–848. At Rajghat, occupation begins with a dominantly black-slipped ware phase. An interesting feature of the archaeology of this region is the association between its innumerable marshy depressions and archaeological sites, some of which contain a very limited quantity of microlithic flakes on the surface (cf. Susipar in the Gorakhpur area). In fact, a mesolithic level at Jahuraganj on the bank of the Ganga

was reported in the late nineteenth century by A.C.L. Carlleyle. Another important development in the archaeology of this region is the discovery of a large number of black-and-red ware and later sites in the modern Sonabhadra or Robertsgang area. This is a fertile plateau region to the south of Mirzapur and on the way to Chopan on the Son. A site known as Raja Nala Ka Tila on the bank of the Karamnasa river has been excavated. Its Period I is associated with black-and-red ware, microlithic chips, a clay sling ball, shell, terracotta beads, discs, bone points and arrowheads. The plant remains include rice, barley, lentil, field-pea, ragi and foxtail millets, khesari and moong. Period II is iron-bearing and begins around calibrated BC 1300 (unconfirmed, but presumably correct, report puts the presence of iron in Period I itself). The area lies on an early historic route from the Ganga plains to central India and beyond and the find of a large number of protohistoric sites here indicates the possibility of links between central India and the Ganga plains through this area during the protohistoric period.

### *Western Uttar Pradesh*

Village life in this region begins with the Ochre Coloured Pottery (OCP) level and the 'late Harappans', if not with the end phase of the mature Harappan itself. The easternmost occurrence of the OCP level is at Sringaverapura near Allahabad, whereas the late Harappan distribution area does not seem to extend below the Delhi-Meerut-Bulandshahr zone. On the other hand, the OCP level goes up to the Saharanpur-Haridwar area beyond this zone, and thus its distribution partly overlaps with the late Harappan distribution. It is not easy to determine which began earlier, although one can be certain of a chronological overlap. A more serious problem is to determine if the OCP itself is a variant of the late Harappan phenomenon. At sites like Ambkheri and Bargaon both these elements are found mixed, whereas there are other OCP sites where the late Harappan pottery element is absent. According to one school of thought the OCP complex grew out of a dispersal of early Harappans or premature Harappans to the Doab. On the whole, there is little doubt that the late Harappans and the OCP complex are closely intertwined, even if we cannot be sure of the details.

No other site gives a better idea of the transformation of the Harappans in the Doab than Hulas, a *c.* 5 ha site on the bank of the eastern Yamuna canal which may represent an old drainage line. Here 43 structures of different phases of Harappan occupation have been excavated over 2000 sq m of the mound. The five structures of the earliest phase were rectangular, made of mud-bricks and associated with rammed floors, post-holes and hearths. In

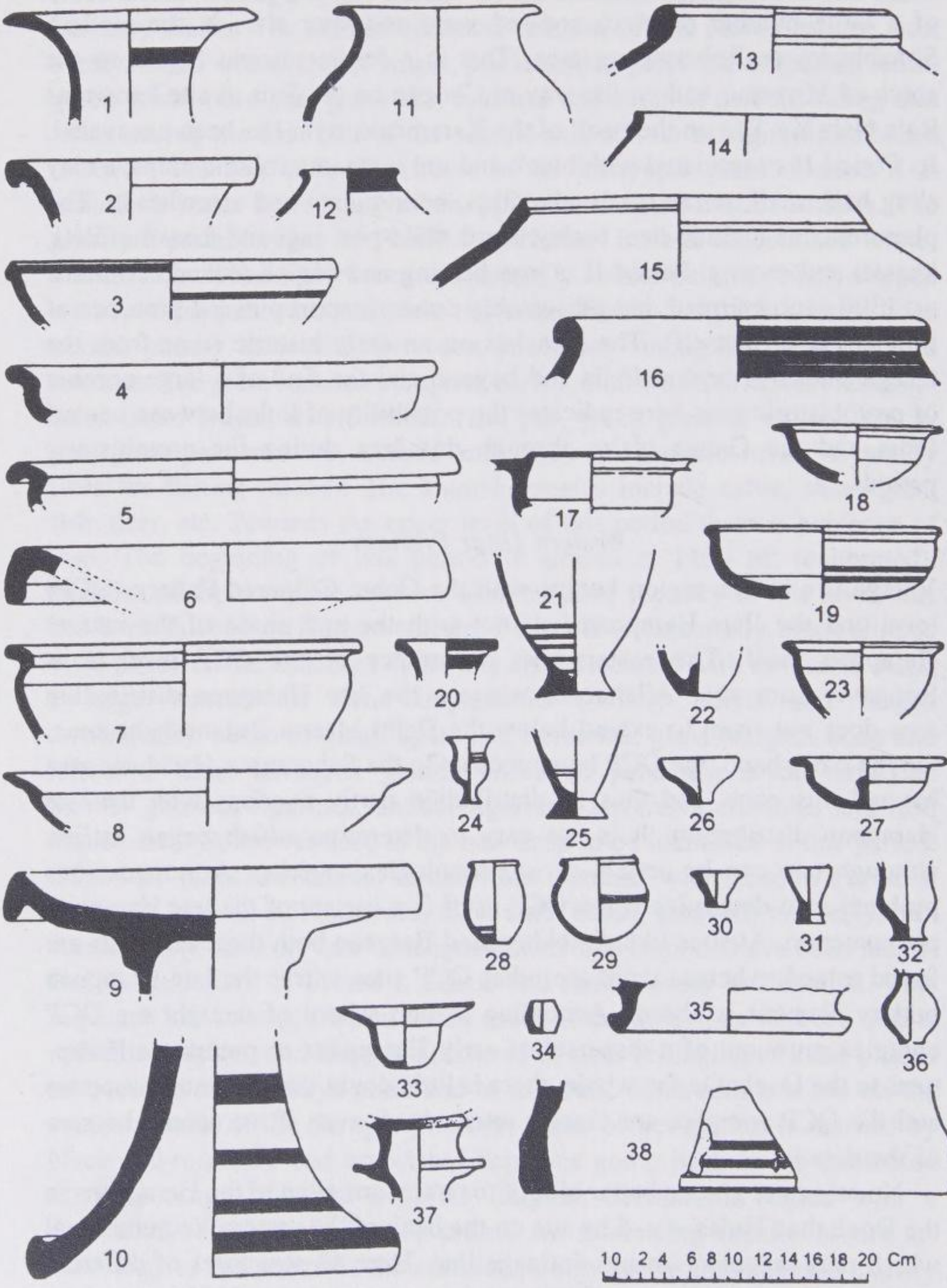



Fig. 40 Hulas 'late Harappan' pottery (Dikshit, 1984)

the middle phase (32 structures), 16 circular wattle-and-daub structures (2.20 to 1.40 in diameter and laid on foundation trenches of about 15 to 20 cm depth and 20 to 50 cm width) which occurred in clusters of two or three were found in parts of the rectangular mud-walled houses. Some of them could have been used as storage bins of a type that is still encountered in the countryside. Five round 'furnaces' (cf. 1.80 × 1.25 m size) were noticed inside the rectangular rooms in the upper or final phase (six structures), although the associated craft activity has not been understood. The antiquities comprised miscellaneous terracotta objects, including animal figurines and 'cakes', fragmentary objects, of copper, saddle querns, bone points, beads, bangles and pots made of faience and beads of carnelian and agate. The thermoluminescent date of the upper phase is 1280 BC, with some radiocarbon dates putting the beginning of the site before 2000 BC. It is not certain if the crops identified—wheat, barley, rice, ragi millet, and a variety of legumes—were present throughout.

The excavator of Hulas, K.N. Dikshit, divides the Harappan complex in western Uttar Pradesh in two phases: Phase 1 (cf. Alamgirpur and Hulas) with typical Harappan pottery, carnelian beads, terracotta animal figurines, triangular cakes, stone objects and burnt bricks and Phase 2 (cf. Bargaon) with an unslipped red ware which looks like the OCP.

The OCP level has been excavated in some detail at Atranjikhera in Etah district and at Lal Qila in Bulandshahr district. Both these sites are on the bank of the Kali Nadi, a tributary of the Ganga. It was once thought, perhaps with no justification, that the ochrous state of the sherds found in this level meant long deposit in a water-logged state which in turn denoted a prolonged flood condition in its distribution area. The thermoluminescent dates point to a mean date of 1880 BC for Lal Qila where oblong wattle-and-daub houses showing post-holes and mud floors associated with complete animal skeletons and circular fire-pits containing charred animal bones seem to be common. Although the faunal assemblage of Lal Qila as a whole has been grouped into domestic cattle, buffalo, sheep, goat, pig, horse, dog and (wild) deer, the report does not attempt to identify the complete skeletons found associated with house floors. There were three sizes of cattle and many of the bones examined bear cut and burn marks. Wheat, barley and rice have been clearly identified. Bowls, lids, basins (occasionally with handles on both sides), troughs, dishes, dish-on-stands, storage vessels, etc. constitute the main forms of an essentially red ware assemblage. A semi-naturalistic humped and long-horned bull with two stylized representations of curved horns has been found painted on the ovoid body of a vase. Post-firing graffiti marks and a variety of incised designs occur on some sherds. The range of terracotta objects is impressive: anthropomorphic figures,

animal and human figurines, birds, wheels, bangles, sling-balls, ear-studs, crucibles, gamesmen, discs, beads, etc. There were stone querns, pounders and beads, along with bone points and copper beads, pendants, arrowheads and celts. Two female figurines in terracotta are not stylized at all; they display a distinct art style. The interesting aspect of the wattle-and-daub houses (rice husks in mud plaster) of the OCP level at Atranjikhera is that the posts of babul, sissoo, sal and chir pine trees were used, with chir pine coming from the Himalayan belt. There is no reason to believe that sissoo and sal were imported too. Their present absence in the area does not mean that they could not grow earlier. Another important aspect is the use of rice, barley, gram and khesari. This suggests that two crops were grown in a year: rice in summer and barley and legumes in winter. The find of an unlined or *kutchcha* well is the first of its kind.

The site Jodhpura of the Ganeswar–Jodhpura culture, to which we have drawn attention earlier, has been taken to belong to the OCP complex. However, this site has shown four phases of this level, and it seems that it is its final phase which is manifested in the Doab sites. The OCP phases at Jodhpura are the following: Phase A: rolled, ill-fired, undecorated OCP of indeterminate shapes, cattle footprints; Phase B: wheel-turned un-decorated OCP; Phase C: circular huts, red-slipped pottery with both in-cised and painted designs; Phase D: the full development of OCP, the pottery shapes and decorations being comparable with the Atranjikhera and Lal Qila specimens. If in the Doab the OCP level falls in the first half of the second millennium BC, beginning around 2000 BC, its beginning at Jodhpura is considerably earlier, as its late fourth millennium calibrated BC date suggests.

### *Upper Ganga Valley 'Copper Hoards'*

An important aspect of the OCP complex in this region is its association with 'copper hoards'. Hoards of copper objects have also been found in the Chhotanagpur plateau region of Bihar and West Bengal and the Balaghat area of south-east Madhya Pradesh, but the 'hoards' of these areas cannot be dated. We have elsewhere argued that the Bihar–West Bengal hoards are not protohistoric and may date from much later historic periods when these could denote metal 'ingots' for the profuse manufacture of 'bronze' religious images. The Gungeria find in Balaghat, which yielded 424 copper implements along with silver discs and bucrania, cannot be dated in the present stage of knowledge. It is useful to cite our earlier analysis of the typical upper Ganga valley specimens.

The artefact types concerned are anthropomorph/sleeved or lugged axe, harpoon and antennae-hilted sword. First, the occurrence of the first type in the mature

Harappan context at Lothal takes back the antiquity of this type to at least some point in the second half of the third millennium B.C. Secondly, the association of harpoon (also, a hooked sword) with the OCP level at Saipai in the upper Gangetic valley puts it in the first half of the second millennium B.C. Moreover, the context of an accidentally discovered harpoon at Mitathal in Haryana is probably the late Harappan level of the site which has to be roughly contemporary with, or earlier than, the OCP level of Saipai. An independent stratigraphic check on antennae-hilted sword comes certainly from the Jorwe level at Chandoli in Maharashtra and possibly from the fragment of a mid-ribbed sword in the Malwa culture at Navdatoli. The mid-second-millennium B.C. horizon may be taken as reasonably certain. That the discovery of antennae-hilted swords in the Mehsana area of Gujarat is not a freak or undependable find has now been made amply clear from D.P. Sharma's report on the 'Mehsana type' finds from the upper Gangetic valley itself. . . . In this context, the finds of this type of sword from Kallur in the Raichur district of Karnataka, Mungarar T.E. in Kerala and from Savinipati in the Ramanathapuram district in Tamil Nadu make sense. First, the distribution itself is geographically coherent, along a well-defined line of movement from the upper Gangetic valley to the deep south through Malwa (Navdatoli) and both north (Chandoli) and south (Kallur) Deccan. Secondly, the idea of a pre-iron 'chalcolithic' horizon in the south is now clearly feasible, mainly from A. Sundara's find of a copper object from a neolithic burial at Terdal in Karnataka. Thus, taking the middle of the second millennium B.C. as a kind of base line we can argue that during the period between this line and sometime in the second half of the third millennium B.C. there was a distinct centre of the manufacture of copper objects in the upper Gangetic valley with interactions stretching to include Haryana, Gujarat, Malwa, north and south Deccan, Kerala and the southern section of Tamil Nadu. By implication, Rajasthan also was included in this chain of interaction.

. . . we have previously noticed the emergence of the Ganeshwar and the adjacent areas of northern Rajasthan as an independent copper metallurgical centre as early as the close of the fourth millennium B.C. That this area continued to be significant as a metallurgical centre till a much later period is evidenced by a number of features. We isolate only two artefact types in the present context: plain axes with round indentation marks on one face, and what has been called a *Parasu* or a kind of double axes with space for handle in between the two opposing axes. The first type occurs at a number of sites in the upper Gangetic valley. . . . Similarly, they have been found at Kayatha in Malwa.

The second diagnostic type, *Parasu*, occurs stratigraphically . . . in the Ahar culture at Ahar in southeast Rajasthan and in the late Harappan contexts of Rojdi and Mitathal. The interaction pattern of the northern Rajasthan and southern Haryana centre covering the upper Gangetic valley, the rest of Rajasthan, Gujarat and Malwa is thus quite clear.

Of these two centres, the northern Rajasthan–southern Haryana and the upper Gangetic valley, the former is considerably earlier than the latter. The upper Gangetic valley centre apparently came up much later, possibly not earlier than the closing centuries of the third millennium, and it is the first half of the second millennium which has to be considered its main focus. The interaction stretch of

the upper Gangetic valley centre obviously travelled as far south as Karnataka, Kerala and Tamil Nadu, but as we have noted, this feature is geographically consistent and understandable.

What, however, we find most intriguing is the emergence of the northern Rajasthan–southern Haryana centre with its focus around Ganeshwar in Rajasthan and Narnaul in Mahendragarh in Haryana as apparently the most significant copper metallurgical centre of protohistoric India, maintaining its prominence right through the early Harappan, mature Harappan, late Harappan and the chalcolithic cultures of southeastern Rajasthan and Malwa. . . . It is obvious that the upper Gangetic valley centre became important only in the last and uppermost segment of this sequence, and till now we do not even know if it was really a case of a major copper metallurgical centre in the upper Gangetic valley or it was basically a case of expanded horizon of the northern Rajasthan–southern Haryana.[11]

The OCP horizon and the associated finds of 'copper hoards' give way in the upper Ganga valley to the black-and-red ware level, the most systematic evidence of which comes from Atranjikhera and Jakhera. At both these sites the black-and-red ware (mostly unpainted) was accompanied by black-slipped and red wares. Atranjikhera yielded copper, carnelian and shell beads, a copper ring, a broken bone comb, miscellaneous fragments of stone pestles, etc. and cores and flakes of quartzite, chalcedony, agate and carnelian. The last item has been placed, doubtfully, as the manufacturing debris of beads. The housing evidence is more clear at Jakhera: three successive floor levels with oval/circular wattle-and-daub houses with well-prepared mud floors, post-holes and circular fire-pits containing ash, pottery, bones and antiquities. At Jakhera the antiquities included tanged and barbed bone arrowheads with circlet design, pottery discs, and two iron objects (one an arrowhead with a long tang). The discovery of iron objects in the black-and-red ware level was made in 1992–93 and supports what the present author wrote in 1983: 'The profusion of iron in the Painted Grey Ware level suggests, according to us, the clear probability of its effective beginning in the earlier Black-and-Red Ware stage.'

In western Uttar Pradesh, the black-and-red ware level was succeeded by the painted grey ware phase. This phase is distributed widely not merely in western Uttar Pradesh or broadly the Ganga–Yamuna Doab but also in the Indo-Gangetic divide as a whole. In Haryana and Indian Punjab the sites of this phase are many, with some extensions beyond.

The distribution of sites of grey ware associated with painted grey ware are: Jammu (1), Punjab (109), western Uttar Pradesh (24), Rajasthan (8); and P.G. Ware are: Haryana (258), Punjab (108), UP (218) and Rajasthan (101). Generally, according to a study of 43 sites on the basis of the size of the mound, the population varied from 200 to 1500–2000 persons in 1.1 to 2.1 hectares. The biggest painted grey

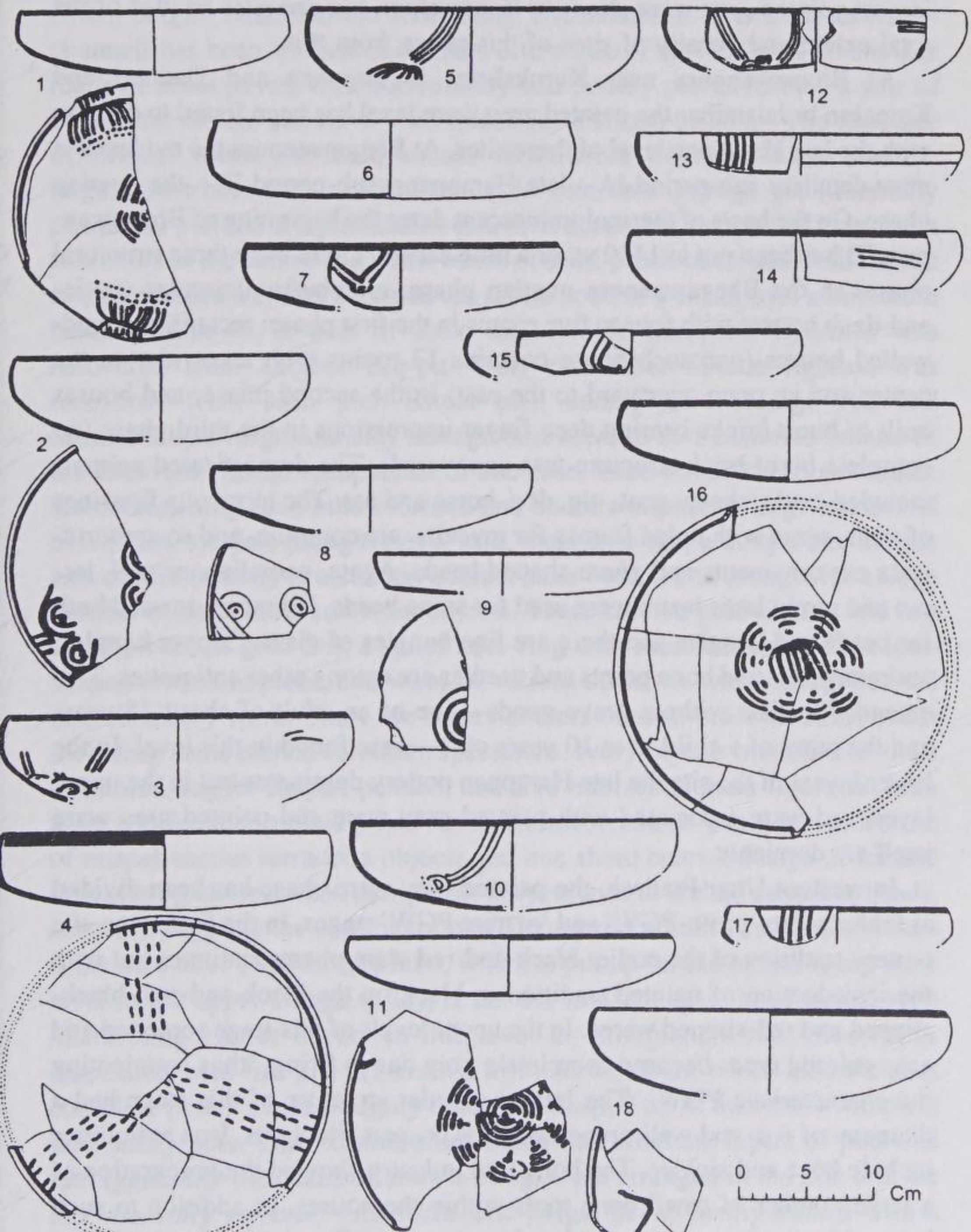



Fig. 41 Painted grey ware

ware settlement is Satwadi in Cholistan, Bahawalpur (Pakistan) which is 13.7 hectares.[12]

One can ignore the precise numbers cited above and the statement that the largest painted grey ware site is in Bahawalpur, but one gets an idea of the total extent and density of sites of this phase from this.

At Bhagawanpura near Kurukshetra in Haryana and Dadheri and Katpalon in Jalandhar the painted grey ware level has been found to overlap with the late Harappan level of these sites. At Bhagawanpura the evidence is most detailed: sub-period IA—late Harappans; sub-period IB—the overlap phase. On the basis of thermoluminescent dates the beginning of Bhagawanpura IB has been put in 1400 BC or a little earlier. There were three structural phases in the Bhagawanpura overlap phase: circular/semicircular wattle-and-daub houses with four to five rooms in the first phase; rectangular mud-walled houses (one such house contains 13 rooms with a corridor in the centre and an open courtyard to the east) in the second phase; and houses built of burnt bricks bearing deep finger impressions in the third phase (no complete burnt-brick structure was uncovered). The domesticated animals included cattle, sheep, goat, pig, dog, horse and ass. The terracotta figurines of rams, some with holed frames for toycarts, are common, and so are terracotta ear ornaments and *ghata*-shaped beads. Agate, carnelian, crystal, jasper and rarely lapis lazuli were used for stone beads. Faience was used both for beads and bangles and there are fine bangles of glass. Copper bangles, antimony rods and bone points and needles are among other antiquities. Two extended burials without grave-goods—one of an adult of about 35 years and the other of a child (8 to 10 years old)—were found in this level. In the lower layers of the site the late Harappan pottery dominates but in the upper layers red ware associated with painted grey ware and painted grey ware itself are dominant.

In western Uttar Pradesh, the painted grey ware phase has been divided at Jakhera into 'proto-PGW' and 'mature PGW' stages. In the first stage, the pottery tradition of the earlier black-and-red ware phase continues but with the introduction of painted tradition in black on the black-and-red, black-slipped and red-slipped wares. In the upper levels of this stage some red and grey painted types become completely grey due to firing, 'thus anticipating the characteristic PGW'. The largest circular structure of this stage had a diameter of 6 m and well-prepared floors possess ritual pits. Iron antiquities include hoes and sickles. The bone tool industry showed the preparation of a large number of small bone tools within the houses, in addition to such bone objects as combs, arrowheads, mirror handles, antlers with sawing marks, etc. There are terracotta crucibles (copper smelting?) and semi-precious stone beads. Typical painted grey ware—bowls, dishes and basins

with black geometrical (short strokes, linear strokes) and sun/floral designs on the surface of a body of fine, well-levigated clay—occurs in the second stage when a low bund-like mud embankment (4.8 m basal width and 1.2 m extant height) encircled the settlement. The existence of two moats/water-channels has been confirmed on the western side of the mound. Two circular roads or lanes paved with horizontally laid pottery pieces formed a pair of concentric circles and have been traced for a length of 30 m. The diameter of circular wattle-and-daub houses varied from 7.6 m to 4.5 m and the largest post-hole had a diameter of 35 cm. One storage pit (internally plastered) yielded a lapis lazuli bead, five decorated buttons of ivory with two holes in the centre and a few beads of semi-precious stones. A ritualistic fire-pit yielded a crudely formed terracotta hood of a snake with a miniature handmade bowl. A pair of male and female terracotta figurines was recovered from another fire-pit. Only one other female figurine was recovered from such pits. Ritual pits, underground storage pits and occasionally overground clay storage bins seem to be a common feature of the excavated house complexes. In one case, three circular/oval structures, almost touching each other, formed one house complex. A large number of iron (hoes, sickles, ploughshares, slag, magnetite ore, among other things) and copper (mostly ornaments) objects have been found along with a large number of bone tools and other objects. There are five gold objects and two small pieces of gold foil: a spiral nose-ring with rounded terminals, a leaf-shaped ornament piece, and wires of various thickness which could be used in embroidery work. There are large numbers of semi-precious stone beads including some etched carnelian specimens. Ivory objects include a comb, a decorated dagger-shaped pendant and five buttons. Human figurines, both male and female, probably had ritualistic associations. There is a profusion of miscellaneous terracotta objects and one sherd bears a design of incised intersecting circles. This, along with the presence of etched carnelian beads, certainly suggests the continuation of Harappan tradition, and one wonders if the date of *c.* 1100 BC and later, which is put up for the painted grey ware level in the upper Ganga valley, is not too low. An agate bead etched with intersecting circles occurs in this level at Atranjikhera too. Mud-floors associated with fire-pits are known from Atranjikhera which also shows a complete potter's kiln (roughly oval, 1 m deep, 2.35 m diameter) complete with many pots.'The excavation revealed that alternate layers of pots and fuel (generally the cakes of animal-dung) were arranged in the kiln and the top was fully covered with reeds and twigs, being finally closed with a mud-plaster over them.' Wheat was added to the crops of rice and barley at Atranjikhera during this period and irrigation was possibly conducted with the help of *kutchcha* wells, a few of which have been found. Ramie fibres

were used for fishing nets; the list of animal remains (many with cut marks by sharp instruments and found charred) is the same. Like Jakhera, Atranjikhera too has yielded a plethora of iron tools including tongs. Copper objects here include a dish. A general idea of the settlement pattern of the protohistoric upper Ganga plain has emerged from a close settlement survey of Kanpur district: black-and-red ware settlements—9 (6 below 2 ha, 3 between 3 and 5 ha, average spacing 29 km); painted grey ware settlements—46 (40 below 2 ha, 6 between 2 and 5 ha, average spacing 13 km).

The next phase in the Ganga plain is marked by northern black polished ware (NBP) and with this begins the early historical period.

## The Significance of the Indian Neolithic-Chalcolithic and Iron-bearing Cultures beyond the Harappan Distribution Zone

It is the emergence and consolidation of village-farming communities area by area which gives this period its tremendous character and significance. 'This period is one of the most significant ones in Indian history because this seems to be the period in which much of the base of modern village India was laid.' In fact, it is with reference to modern rural India that the period assumes its great character: the same types of regional village houses and regional crop patterns, the same dependence on cattle, the same locations, the persistence of much of the old craft activities, the consolidation of the major lines of movement along which both raw materials and finished goods were traded and exchanged and perhaps the same framework of ritual behaviour. The last feature may not be as clear as the rest, but what we have in mind here is a recurrent emphasis on presumably sacrificial offerings in fire-pits, representations of phallus, and the emergence of terracottas of a kind which forms a significant component of the folk religious life of an Indian village. The element of continuity in craft tradition is manifest in the pre-industrial modes of the technology of bead-manufacture, preparation of miscellaneous stone objects including saddle querns and mullers, smelting and processing of different metals which are still pursued by metalsmiths in different areas in an essentially pre-industrial way and many other ways of doing things in the broad spectrum of pre-industrial village life. There was no isolated village community; the list of raw materials used by them proves more than anything else the extent of their network. Both on the local and regional levels trade was practised, and as far as different metals and raw materials such as lapis lazuli are concerned, there was trans-regional trade too. There is no reason to postulate that the society was egalitarian. There was a distinct two-tier

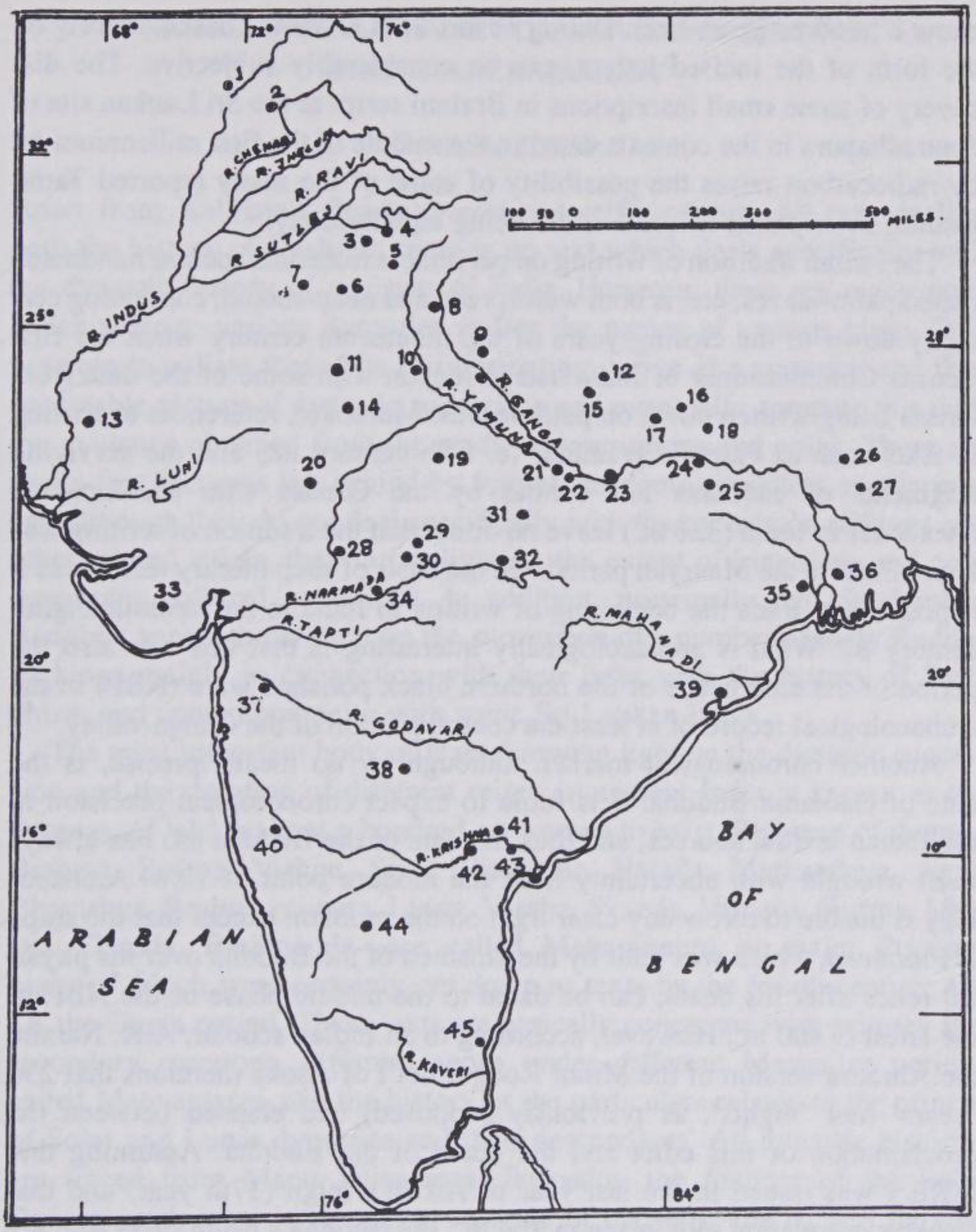
site hierarchy, and combined with the miscellaneous bits of information on fortification walls, embankments, ditches, etc. this supports the notion of 'chiefdom' at this stage. The distribution of sites conforming to modern administrative territories seems to suggest the existence of nascent political units. The long crop lists also serve the purpose of demonstrating that in many areas double-cropping was practised and this, in turn, implies that some local irrigation systems were in place. Finally, we draw attention to the dissemination of some copper object types from the southern Haryana–upper Ganga area to Gujarat, Kerala and southern Tamil Nadu along well-defined routes through Malwa and the Deccan. The date of this movement, as we have argued, falls in the first half of the second millennium BC and clearly imparts the image of the subcontinent as a whole opening up in a way which we did not observe before. This process of opening up becomes clearer as more data accumulate; pottery types seem to get distributed with bewildering rapidity and major sites crop up in areas where none was suspected before (cf. 'chalcolithic' black-and-red ware and earlier sites in Orissa, 'chalcolithic' sites in the Sonbhadra area on the way to central India). When the early historic period emerges in the Ganga plain and elsewhere, it does so in the secure context of a subcontinent that we now know.

# VII

# The Archaeological Foundations of Early Historic India

Technically, this begins with the earliest archaeological evidence of historical writing in the form of the Asokan inscriptions found in a very large part of the subcontinent in the third century BC. This Mauryan king caused his inscriptions to be engraved in four scripts—Brahmi, Kharosthi, Aramaic and Greek. The Asokan edicts in Aramaic and Greek come from south Afghanistan, with a single instance of Aramaic being known from Taxila in Punjab. The use of Kharosthi was basically limited to the north-western part of the subcontinent, whereas the Brahmi, with some regional peculiarities was used throughout the rest of India. At this point we have to answer two questions: first, is there any proof of an inscription in India in the pre-Asokan period, and second, is it possible that the tradition of writing on perishable materials in India goes back to an earlier period? The answers to both questions are relatively straightforward.

Regarding the pre-Asokan antiquity of Indian inscriptions, several inscriptions—the Badli pillar inscription, Eran coin legend, Bhottiprolu relic casket inscription, Taxila coin legends in Brahmi, Mahasthangarh Brahmi inscription, Piprahwa relic casket inscription, Sohgaura copper plate inscription and the inscription on the silver coins of Sophutes (or Saubhuti, a king of Punjab (?) who submitted possibly first to Alexander and then to Seleucus Nikator)—were once taken to be pre-Asokan. While the Saubhuti coin inscription, being in Greek (his silver coins are copies of an issue of Seleucus Nikator and the inscription is in Greek—'of Sophutes') does not come into the picture, the other inscriptions were all accepted as pre-Asokan by earlier scholars. However, more recent scholars like D.C. Sircar and A.H. Dani have dated them later, although both disagree about their actual dates. For instance, whereas Sircar dates the Sohgaura copper plate inscription in the third century BC, Dani puts it




*This map is neither accurate nor to scale*

Map 8 Some Early Historic Sites 1. Charsada, 2. Taxila, 3. Sunet, 4. Rupar, 5. Kurukshetra, 6. Agroha, 7. Rangmahal, 8. Hastinapur, 9. Ahichchhatra, 10. Mathura, 11. Bairat, 12. Lumbini, 13. Brahmanabad, 14. Rairh, 15. Sravasti, 16. Lauriya Nandangarh, 17. Kusinagar, 18. Vaisali, 19. Padmavati, 20. Nagari, 21. Kausambi, 22. Bhita, 23. Varanasi, 24. Pataliputra, 25. Rajagriha, 26. Bangarh, 27. Mahasthangarh, 28. Ujjayini, 29. Vidisa, 30. Sanchi, 31. Bharhut, 32. Tripuri, 33. Amreli, 34. Maheshwar, 35. Tamralipta, 36. Chandraketugarh, 37. Nasik, 38. Kondapur, 39. Sisupalgarh, 40. Brahmapuri, 41. Jaggayyapeta, 42. Nagarjunakonda, 43. Amaravati, 44. Brahmagiri, 45. Arikamedu

about a hundred years later. Dating of this kind, which is based entirely on the form of the incised letters, can be considerably subjective. The discovery of some small inscriptions in Brahmi script at the Sri Lankan site of Anuradhapura in the contexts dated in the middle of the first millennium BC by radiocarbon raises the possibility of some of the many reported Tamil Brahmi inscriptions in south India being equally early.

The Indian tradition of writing on perishable materials such as handmade paper, palm-leaves, etc. is both widespread and deep-rooted, continuing certainly down to the closing years of the nineteenth century when the first Census Commissioner of India had to reckon with some of the data from Orissa being written down on palm leaves. Moreover, references to writing in texts such as Panini's grammar (*c.* fifth century BC) and the surviving fragments of accounts left behind by the Greeks who accompanied Alexander to India (326 BC) leave no doubt that the tradition of writing was known before the Mauryan period. On the basis of such literary references it is possible to trace the beginning of writing in India to the seventh–eighth century BC. What is archaeologically interesting is that this was also the period of the emergence of the northern black polished ware (NBP) in the archaeological record of at least the central portion of the Ganga valley.

Another chronological marker, although by no means precise, is the date of Gautama Buddha. It is futile to expect chronological precision in the Indian textual sources, and thus the date of the Buddha too has always been wrought with uncertainty from the modern point of view. Archaeology is unable to throw any clear light on the problem except that the stupa at Piprahwa, which was built by the kinsmen of the Buddha over his physical relics after his death, can be dated to the middle phase of the NBP, at the latest *c.* 400 BC. However, according to an Indian scholar, A.K. Narain, the Ahraura version of the Minor Rock Edict I of Asoka mentions that 256 'years' (not 'nights', as previously supposed) had elapsed between the proclamation of this edict and the death of the Buddha. Assuming that MRE I was issued in the last year of Asoka's reign (37th year) and that Asoka's coronation took place in 264 BC, the Buddha's death dates 483 BC. The Buddha lived, according to tradition, for 80 years, and thus was born in the sixth century BC.

On the whole, we may accept sixth century BC as the general period of the beginning of the early historic stage in the Ganga valley, keeping in mind the possibility of its being a couple of centuries earlier. This early date has emerged for the NBP at Sringaverapura, but it may be recalled that long before the significance of the NBP was realized in Indian archaeology, John Marshall argued on the basis of his excavations at Bhita that the NBP went back to the eight century BC.[1]

## THE HISTORICAL FRAMEWORK OF EARLY HISTORIC INDIAN ARCHAEOLOGY[2]

### *Dynastic History*

Apart from Kalhana's *Rajatarangini*, a twelfth century AD text dealing with the history of Kashmir, there is no text which deals specifically with the dynastic history of any part of India. However, there are many texts which refer to various dynasties and/or the names of various kings. It is possible to collate these bits of information, arrive at a common and thus acceptable picture of dynastic succession and eventually compare this with the evidence obtained from the study of inscriptions and coins. There are also a few accounts left behind by foreign residents, travellers or pilgrims, and although they do not deal specifically with the succession of kings and other related issues, they throw light on the extent of kingdoms and contemporary political conditions. In addition, principally two Sri Lankan Buddhist annals throw light on the succession of a number of early Buddhist kings mainly in connection with their links with the history of Buddhism and contemporaneity with some Sri Lankan kings.

The most important body of texts throwing light on the dynastic succession and the duration of different reigns in ancient India is known as the Puranas, of which about a hundred are known to exist. Eighteen of them—Brahma, Padma, Vishnu, Siva, Bhagavata, Narada, Markandeya, Agni, Bhavishya, Brahmavaivarta, Linga, Varaha, Skanda, Vamana, Kurma, Matsya, Garuda, Brahmanda—are called Mahapuranas or major Puranas, many of which were certainly put down as texts by the fourth century AD, i.e. the Gupta period. These texts are basically concerned with primary and secondary creations, different aeons under different Manus or periods called Manvantaras, and the history or the particulars related to the princes of Solar and Lunar dynasties and their descendants. All dynastic histories are traced from Manu Vaivasvata. Ikshvaku, the founder of the Solar Dynasty with roots in Ayodhya, was one of his sons, and so was Ila who turned into a woman and became the mother of Pururavas, the progenitor of the Lunar Dynasty with its base in Pratisthana or modern Paithan in the Deccan. The various dynasties derived from these two primal dynasties are described up to the battle between the Pandavas and Kauravas, i.e. the war described in the epic Mahabharata. The period after this legendary battle is related in the form of prophecies.

> Brahman Kautilya will root out the nine Nandas. Upon the cessation of the race of Nanda, the Mauryas will possess the earth, for Kautilya will place Chandragupta on the throne: his son will be Vindusara; his son will be Asokavarddhana; his

son Suyasas; his son will be Dasaratha. . . . These are the ten Mauryas, who will reign over the earth for a hundred and thirty-seven years (*Visnupurana*, chapter 24)

Such prophecies ceased with the early Gupta kings.

The Puranas are the major storehouse of Indian folk-memory, the tradition being continuous from the major Puranas to the many Mahatmyas or panegyrics in honour of a variety of things including pilgrimage or tirtha-yatra. On the other hand, there are various recensions which have been edited and re-edited through time with old matter discarded and new matter added, leading on the whole to a hopelessly imprecise chronological situation: 'I submit that it is not possible to set a specific date for any Purana as a whole' (Rocher, 1986). However, this is the only body of texts which mentions genealogies and their durations, and when viewed in the light of testimony of various other miscellaneous texts, coins and inscriptions, there is an internal consistency of the evidence. From the historians' point of view it is this internal consistency which matters.

It is not that this internal consistency can be supported by archaeology till at least the inscriptions and coins appear. The problem with the pre-Buddhist literary tradition of India—the tradition of the four *Vedas* and the associated literature down to the *Upanishads*—is that their absolute dating, internal stratification and cultural interpretation have all been so deeply buried in the morass of often conflicting hypotheses and so closely linked to the premise of Aryan invasion towards the end of the Indus civilization that something as tangible and chronology-bound as archaeological data can logically find no place in it. Despite having a rich pre-Buddhist literary tradition and a long pre-Buddhist vista of Indian history through archaeology, there is not a single chronological point illuminated both by literature and archaeology before the Buddha lived in the sixth–fifth century BC. However, if one gives up the thought of correlation and focuses on the literary tradition alone, one cannot help being aware of a very shadowy segment of time under the rubric of 'traditional history'.

In H.C. Raychaudhuri's analysis of this history it begins with the king Parikshit who ruled over the Kuru country between the ancient river Sarasvati and the Ganga (i.e. the Indo-Gangetic Divide) after the battle described in the epic *Mahabharata* was over. The Kuru capital was first at Asandivat (modern Asandh near the Drishadvati) and then at Hastinapur (on the bank of a dried-up course of the Ganga near Meerut), before being shifted to Kausambi in the lower Doab. Parikshit's son, Janamejaya, reputedly annexed Taxila, and this suggests, among other things, a political unit extending from the Potwar plateau in the north-west to the upper Doab. In the east the kingdom of Videha under Janaka was the most im-

portant centre of power, corresponding to the central section of north Bihar with the Gandak or Sadanira as its western boundary. Its capital Mithila remains unidentified. The founder of this kingdom was Videgha Mathava who came from the bank of the Sarasvati following the fire-god who went burning along the earth from the banks of the Sarasvati. Janaka was reputedly a great performer of sacrifices and his court was the gathering point of many Brahmins from the upper areas of the Ganga plain.

There were eight other states in north and north-west India: Gandhara (Peshawar and Rawalpindi area), Kekaya (between Jhelum and Chenab), Madra (between Chenab and Ravi), Usinara (? modern Haridwar area), Matsya (Alwar area), Panchala (Bareilly, Budaun, Farrukhabad and the adjoining districts of Rohilkhand and central Doab), Kasi (Banaras area) and Kosala (roughly the trans-Sarayu plain). Now or soon afterwards one hears of Vidarbha (Berar), Kalinga (Mahanadi delta), Assaka or Asmaka in the Nagpur area and Dandaka (? Nasik area) One also knows of tribes in trans-Vindhyan India: Andhras, Savaras, Pulindas and Mutibas.

These historical geographical units seem to become less shadowy in the Buddhist and Jaina sources which possibly relate to the sixth century BC. The Buddhist text *Anguttara Nikaya* mentions Kasi, Kosala, Anga (roughly the Bhagalpur area of Bihar), Magadha, Vajji/Vrijji (the Vaisali area of north Bihar), Malla (the Kasia area of eastern UP), Chetiya or Chedi (eastern Bundelkhand), Vamsa or Vatsa (the Kausambi area of Uttar Pradesh), Kuru, Panchala, Machchha or Matsya, Surasena (the Mathura area of Uttar Pradesh), Assaka/Asmaka (? with Adam as its centre), Avanti (the Ujjain area of Madhya Pradesh), Gandhara and Kamboja (in some parts of the north-west close to Gandhara, with its western boundaries possibly touching Kafiristan in north-east Afghanistan). The Jaina *Bhagavati Sutta* list is the following: Anga, Vanga (the Ganga delta between the Bhagirathi and the Padma), Magadha, Malaya (Kerala coast), Malava or Malavaka (?), Achchha (?), Vachchha or Vatsa, Kochchha (Kutch), Padha (Pandya in the Madurai area or Paundra in north Bengal), Ladha (Lata or Gujarat or Radha in the plateau section of West Bengal), Bajji or Vajji, Moli or Malla, Kasi, Kosala, Avaha (?) and Sambhuttara (? Sumhottara ? parts of West Bengal to the west of the Bhagirathi). These sources may not be exactly contemporary but they suggest that before the birth of the Buddha definite geographical and political territories emerged in the subcontinent from the north-west to the east on the one hand and to the south on the other. Their territorial identifications may not always be certain but there is no doubt about the basic tenor of the evidence which in fact conforms to what one learns from the Brahmanical sources.

Four great kingdoms are recorded during the time of the Buddha:

Kosala with Pasenadi or Prasenjit as its king and Sravasti as its capital; Vatsa with Udayana as its king and Kausambi as its capital; Avanti with Pradyota as its king and Ujjayini as its capital; and finally, Magadha with Bimbisara as its king and Rajagriha as its capital. Further, during the Buddha's time Gandhara is mentioned as an independent 'great principality' (*Mahajanapada*), although soon afterwards, in the Behistun inscription of Darius (520–518 BC), Gandhara appears among the conquests of the Achaemenid dynasty which had its base in the Fars area of Iran and its capital at Persepolis near modern Shiraz.

The next phase of north Indian political history is marked by the rise of Magadha under four successive dynasties: the Barhadrathas, Haryankas, Saisunagas and Nandas. Bimbisara and Ajatasatru, who were father and son and contemporaries of the Buddha, seem to have played the first major role in the process of Magadhan expansion which could have something to do with its proximity to the rich raw material distribution of the Chhotanagpur plateau to its south. Bimbisara added Anga and a part of Kasi to the Magadhan dominion whereas his son Ajatasatru had struggles with Kosala and Vajji. With its base consolidated up to the central section of the Ganga plain Magadha could look towards the Malwa plain, and the king Sisunaga of the Saisunaga dynasty defeated Avanti before the control of Magadha could go to the Nandas. The king Mahapadmananda of the Nanda dynasty overthrew all the dynasties which ruled contemporaneously with the Saisunagas, such as the Ikshvakus, Panchalas, Kasis, Haihayas, Kalingas, Asmakas, Kurus, Maithilas, Surasenas, etc.—virtually the whole of north India up to the Doab on the one hand and the Deccan on the other.

The Achaemenid annexation of Gandhara took place possibly under Cyrus (558–530 BC), if not under his son Darius who sent a Greek, Scylax, to explore the navigability of the Indus. The Indians were in the Persian army against Greece under his son Xerxes. Under the Achaemenids, the Indus valley was drawn into a political unit which stretched in the west up to north Africa, and this must have meant a clear definition of at least the Indus valley in the contemporary world of western Asia. In 326 BC Alexander came as a successor of the Achaemenid dominion in the Indus valley, although this dominion was unlikely to have continued later than the reign of Artaxerxes II, Mnemon (405–358 BC). Alexander advanced up to the Beas, defeated the Northwestern Frontier, Punjab and Sind tribes and kings and went out by sea, sending back a general overland along the Makran coast of Baluchistan. The basic significance of Alexander's invasion from the Indian point of view was the establishment of a Greek kingdom to the north of the Hindukush, which had its repercussions in the Indian north-west by the second century BC.

Assisted by his Brahmin Prime Minister/chief adviser Kautilya, as a number of Indian sources including the Puranas suggest, Chandragupta Maurya ascended the throne of Magadha in *c.* 324 BC. The exact date is not known but it is stated that he came to power immediately after Alexander left. In the north-west, Chandragupta, who was known to the Greek sources as Sandrokotta, took possession of Alexander's conquests to the south of the Hindukush defeating, and marrying the daughter of, Seleucus Nicator who became the successor of Alexander's conquests in the east. The territory controlled by the Nandas fell now to Chandragupta's lot. Among other things, he controlled the Saurashtra peninsula, as a later inscription from Girnar suggests. The Jaina tradition is strong in the belief that he was in possession of Mysore/Karnataka, and some scholars have pointed out a Tamil tradition suggesting that his army moved as far south as the modern Tirunelveli region. The Mauryas had their eastern provincial capital at Mahasthangarh near Bagura in northern Bangladesh, and it is logical to infer on this basis and also on the basis of the location of a major contemporary early historic site at Wari Bateswar near Dhaka that the Mauryan rule in eastern India extended to the Meghna delta and perhaps to the Chittagong coast which led overland to south-east Asia. The establishment of the pan-Indian power of the Mauryas extending from south Afghanistan to the Chittagong coast and from Kashmir to the deep south seems to have come about rather rapidly, but when one thinks of the long period of gestation of different power centres in different parts of the subcontinent, as shown by the long list of names of early principalities and also of the various archaeological cultures of all these areas having close mutual connections, it becomes clear that the pan-Indian dominance of the Mauryas was the culmination of a long and continued process. Chandragupta's reign is further noted for the documented presence of a Greek ambassador, Megasthenes, in his court. Megasthenes' account of the capital city Pataliputra and of the civic and general administration suggests a strongly centralized and well-managed administrative system which was controlled from a large and well-laid-out capital city. The most detailed description of the administrative system current during his time is available in the text known as the *Arthasastra* which is supposedly authored by his prime minister Kautilya/Kautalya. Although the single authorship of this text has been questioned by scholars who find in it evidence of composition in different periods, the general consensus of opinion is that it was indeed a text composed by a single person. We firmly believe in the latter opinion because the type of centralized state the *Arthasastra* depicts was possible in and around this period only.

Chandragupta's son was Bindusara who possibly ruled between 300 and

273 BC and was succeeded by Asoka. He became king in *c.* 269 BC and this suggests that he possibly came to the throne by defeating other possible contenders. He conquered Kalinga in the thireenth year of his reign, and the ugliness of the war registered with him so strongly that he turned to the propagation of *Dhamma* or righteousness instead of embarking on a career of conquests. The distribution of Asokan edicts which proclaim his concern for righteousness on the part of himself and his administration, and reveal on the whole a humane, pious but all-powerful monarch, is the best indicator of the spread of his dominions. His inscriptions have been found in south Afghanistan in Aramaic and Greek, the two languages and scripts which would have been easily understood by his subjects there. In the deep south his edicts have been found in the Chitradurg district of modern Karnataka, and there are references to the people of kingdoms in the south. These southern kingdoms are interpreted as border states. The other regions of India up to and beyond the Nepalese terai were under his control. His edicts are categorized as major and minor rock edicts and pillar edicts. Pillar edicts are few in number and spread in UP and Bihar, but the rock edicts occur widely in his kingdom. The details of these inscriptions suggest effective administration with various categories of officials. The inscriptions comprise 14 major rock edicts, 2 minor rock edicts, 7 major pillar edicts, 7 minor pillar edicts, 2 individual rock inscriptions, etc.

The post-Asokan history of the Mauryas is uncertain. In *c.* 187 BC, the Sungas came to the throne. The first major Sunga king was Pusyamitra who (and his successors) retained control of the Gangetic valley and Malwa. In the Gangetic valley the Sungas were succeeded by the Kanvas, but one of the most important kings of the post-Maurya phase was Kharavela of Kalinga who is known principally from the Hatigumpha inscription near Bhuvaneshwar. Kharavela is known to have attacked Magadha and he perhaps extended his power along the coast up to Andhra. Another major focus of power struggle was in the north-west which successively witnessed the power of the Indo-Greeks, Indo-Scythians and Indo-Parthians. This phase of history in the north-west is known principally from a very extensive range of contemporary coins.

The starting point is that there was a Greek kingdom of Bactria to the north of the Hindukush. That became independent of the Hellenistic empire which was based in Syria and ruled by Antiochus the Great who conducted an expedition up to the north-western part of India or at least the Kabul valley. Three Indo-Greek kings came to the fore in and after this period: Euthydemos, Demetrios and Menander, who between themselves extended the Indo-Greek power in India up to the Indus delta and the

Gujarat coast and, of course, Punjab and beyond. In the next phase, the kings who became prominent are Eukratides of the Indo-Greeks, Mithridates of Parthia and Maues of the Indo-Scythians or Sakas. The chronology of this period is very confusing; we are presented with the numismatic evidence of a motley of kings, the chronological and geographical extent of whose kingdoms leaves a vast room for scholarly speculation and controversy.

Such speculation and controversy is no less under the Kushanas, the dynasty which comes next in the political history of a large part of north India. The Kushanas have a long history. As a nomad group, known as the Yue-Chi in Chinese sources, they first settled down to the north of the Hindukush. The process supposedly took the better part of the last two centuries BC. The Yue-Chis, both south and north of the Oxus river, were divided into five principalities. The first known major king who united these principalities was Kadphises I. He further took possession of the Kabul area and Gandhara and attacked the Parthians to his west and north-west. He had his empire from north-east Iran or Parthia to the Indus/Jhelum, and this comprised territories between the Oxus and the Jaxartes. The Indo-Greek and Indo-Parthian kings of Kabul and Gandhara were obviously supplanted by him. Kadphises I is also known as Kujula Kadphises, and according to B.N. Mukherjee he could not have ruled for more than a decade after AD 56. Mukherjee further argues that his kingdom, in addition to the areas mentioned above, included a part of the Kashmir region and some area to the east of the Jehlam.

The Kushana empire expanded further under Wima Kadphises or Kadphises II, who is known to have possessed the Indus delta on the one hand and Mathura (if not as far east as Banaras) on the other. At Mat in Mathura an image pedestal inscription refers to him as —the great king, the king of kings, son of God, imperial scion of the Kushanas, Vima. He is known to have led an expedition against the Chinese in Chinese Turkestan through the Pamirs, but his army was defeated by the Chinese. He undertook extensive reforms of the contemporary coinage. Wima was succeeded by Kanishka, whose headless stone statue of Mathura red sandstone with his title and name inscribed on it, has figured in countless books on Indian history. B.N. Mukherjee follows the opinion that he came to the throne in AD 78. But this date is by no means universally accepted; others like Vincent Smith prefer a later date. Kanishka retained control of the entire length of the Kushan kingdom from the trans-Oxus region to the Gangetic valley, possibly as far east as Bihar and eastern Malwa and the adjoining regions. A recently found inscription, in fact, is categorical about the extension of his power well to the east in the Gangetic valley. In addi-

tion, he was in control of the Chinese Turkestan, comprising such places as Kashgar, Yarkand and Khotan. Kanishka was a great supporter of Buddhism but the catholicity of his outlook is amply manifested in the depiction of a great number of Buddhist, Iranian, Greek or Greek-inspired and Hindu deities on his coins. 'Kshatrapas' and 'Mahakshatrapas' were among his principal administrators. It was during this period that Buddhist monks spread all over central Asia in the wake of the movement of traders. Like the Mauryan king Asoka before him, Kanishka occurs most prominently in the Buddhist legends, even of much later periods. The third Buddhist council was supposedly held in Kashmir during his reign, and it is possible that a particular place in Kashmir bears his name. He was succeeded by Vasishka about whom nothing much is known except that the Kushana empire was more or less intact under him. The next king, Huvishka, is better known because of his inscriptions from a large number of places including Mathura and Ara in Punjab. An inscription found in the Jamalpur mound of Mathura refers to a monastery or 'vihara' of the great king, the king of kings, son of God, Huvishka. A place in Kashmir supposedly bears his name—Huvishkapura or Hushkapura. Huvishka was succeeded by Vasudeva after whom the Kushana power declined rapidly. In the northwestern part of India, the Kushanas gave way to the Sassanids and in north India their successors were primarily the Guptas. The Kushana emperors styled themselves as 'Devaputras' or 'sons of God', which carried the echo of the Chinese emperors' title 'son of heaven'. The fact that a very large area of Asia from central Asia to the eastern part of the Gangetic valley became one political unit under them permitted a significant amount of political, economic and cultural interaction between the different components of this region.

If the political configurations of the Sungas, Kanvas, Indo-Greeks, Indo-Parthians, Indo-Scythians and the Kushanas dominate various segments of the north-west, the Indus valley and the Gangetic plain in the post-Mauryan India, the Deccan, west India and south India evolved their own but largely interacting political landscapes. In the Deccan the Satavahanas interacted with the Kshatrapas of western India, triumphed over them and eventually extended power to Vidarbha, the Krishna-Godavari delta and the Mysore region as well. In the deep south, a significant political tradition emerged as early as the Mauryan period.

The Satavahanas also go under the name of Andhra Dynasty, and the historical mention of a regional political nucleus in its home territory—the Krishna-Godavari delta in general and the Godavari valley in particular—seems to be as early as the Mauryan period, if not earlier. However, as the area was under the Mauryan control, independent political units could come

up only in the post-Mauryan period. It appears that the Satavahanas came into sharp focus only in the first century BC. According to H.C. Raychaudhuri, the first major king of the dynasty, Simuka, ruled from 60 to 37 BC, reputedly delivering the final blow to the Sunga–Kanva power. He was followed by his brother, Krishna/Kanha, who was described in an inscription from Nasik as a king of the Satavahana family. He was succeeded by Satakarni who, according to the Nanaghat inscription of Nayanika/Naganika, became sovereign of the whole of the Deccan or 'Dakshinapatha'. He also annexed eastern Malwa, and a Sanchi inscription records the gift of a certain Ananda, the son of Vasisthi, the foreman of the artisans of the king 'Siri-Satakarni'. The principal capital was Pratisthana and after his death his wife Nayanika was proclaimed regent. The glory of the later Satavahanas began with Gautamiputra Satakarni (end of the reign *c.* AD 130) who, according to an inscription of his mother, Gautami Balasri, was the slayer of the Sakas, Yavanas and Pahlavas (Parthians). Apart from Maharashtra his power extended to a vast area in both central and west India, from Malwa and Kathiawar or Saurashtra on the one hand to north Kanara on the other. Gautamiputra Satakarni was followed by Vasishthiputra Svami, Sri Pulumavi of inscriptions and coins, and his reign came to an end around the middle of the second century AD. The last great Satavahana king was Yajnasri Satakarni who ruled over Maharashtra, including north Konkan and the Andhra area. His coins bearing the figure of a ship suggest that the king's power extended over the sea. The later Satavahana rulers ruled in Berar, the eastern Deccan and the Kanara country.

An interesting feature of the history of northern and western India during this period was the presence of the Kshatrapas. The eastern portion of Kanishka's empire was apparently under the control of Mahakshatrapa Kharapallana and the Kshatrapa Vanasphara whereas in the northern portion we have the names of the general Lila and the Kshatrapas Vespasi and Liaka. But the Kshatrapas who deserve attention in their own right ruled in central and western India. They are known as the western Satraps who apparently had two dynasties—the Kshaharatas of Maharashtra and the line of Chashtana originally settled at Ujjayini in western Malwa. Chashtana's grandson was Rudradaman who also controlled Saurashtra. The most famous of the Kshaharata kings, Nahapana, had his capital at Nasik and was eventually defeated by Gautamiputra Satakarni.

The dynastic history of the deep south is intimately linked with the Tamil Sangam literature which is 'mostly taken as datable to the first four centuries of the Christian era' but may contain an earlier tradition. A firm fixed point is provided by the references in Asokan inscriptions to the Cholas, Pandyas, Satiyaputras and Keralaputras who are mentioned as

belonging to the bordering territory of his empire in the south. The Cholas were in the Kaveri delta, with Urayur (part of modern Tiruchirapalli) as the capital and Kaveripattinam as its principal port. The Pandya base was in the Vaigai–Tamraparni valley, with Madurai as its capital and possibly Kolkai as its main port. On the basis of the Jambai inscription, the Satiyaputra territory has been located in the general area of South Arcot (where Jambai near Tirukkoyilur is located) and Dharmapuri. The focal point of Keralaputra seems to be its capital Karur, located on the bank of the Amaravati, a tributary of the Kaveri. This lies between modern Coimbatore on the west and Tiruchirapalli on the east. The dynastic history is not very clear, but apparently all these principalities were significant enough to issue their own coins both in the pre- and post-Christian eras.

Patchy kingdoms seem to have cropped up in north India on the ruins of the Kushana empire, and by the early part of the fourth century AD the focus shifted to Magadha under the Guptas.

### *A Geo-political Perspective of Early Indian Political History*

If one takes a geo-political view of even the foregoing brief outline of dynastic history of early historic India up to *c.* AD 300, a few points are clearly driven home. Right at the dawn of recorded history we are confronted with a large number of distinct territorial units throughout the length and breadth of the subcontinent. Obviously these principalities are rooted in the protohistoric past. Once we reach the clear historical light, we see two distinct power foci: the stretch from ancient Anga (east Bihar up to Rajmahal) to Avanti (western Malwa in Madhya Pradesh), and the valley of the Indus which falls in the Oxus–Indus orbit which has its own protohistoric antecedents. Initially two processes were in operation. (1) In inner India the struggle for supremacy in the stretch from Anga–Magadha to Malwa was settled early, leading to the paramountcy of Magadha or south Bihar as early as *c.* 400 BC under the Nandas. This stretch possibly included Gujarat as well, and there is in fact no reason why Magadha under the Nandas could not control the upper Gangetic valley, but on the last point our tradition is silent. We know from a later inscription that the Nandas had some political interaction with Orissa in the Mahanadi delta. (2) In the Oxus-Indus stretch the Achaemenids and the Greeks (under Alexander) held control, and this control was possibly in the form of exerting suzerainty and collecting tributes (because we find the names of various local power bases in the Greek records related to this area and the period). Historically the Oxus-Indus orbit came to be sharply etched during this time.

Under the Mauryas the middle Gangetic valley power base extended on

the one hand to the southern portion of the Oxus-Indus stretch (cf. the Mauryan control of the Indus valley, Kashmir and south Afghanistan) and consolidated itself on the other over the entire orbit of inner India. In the post-Mauryan period there were a few interesting developments. First, the Oxus-Indus orbit exerted itself, successively under the Indo-Greeks, Indo-Scythians and Indo-Parthians. There must have been a number of small kingdoms in this area, with a few powerful monarchs of various dynastic affiliations trying to wrest power from the rest. However, the geographical configuration is clear. During this period the Indus-Oxus orbit brought Gujarat under its control, and made occasional but short-lived forays in eastern Rajasthan and the upper Gangetic valley. Secondly, the Magadhan orbit of power became confined to the earlier zone from Magadha to Malwa. This was the Sunga-Kanva centre of power. The third major feature of the period was the emergence of the Deccan as a distinct centre of political power. The Satavahanas held rule in the Deccan, trying to control the related geographical areas. Fourthly, one has to take note of the emergence of the regional powers beyond the Gangetic plains, such as Kalinga and the kingdoms of the Kaveri delta and its hinterland.

In the first three centuries AD the Oxus-Indus orbit extended up to the central Gangetic valley (if not beyond) under the Kushanas, with Gujarat and Malwa being the centres of struggle between this orbit and the Deccanese orbit under the Satavahanas. During the Gupta period the Gangetic valley asserted itself, and in the Oxus-Indus stretch we first find the Sassanids and then, the Huns and the Hindu Shahi kings, the latter ruling over Punjab to Kabul (thus antedating the much later Sikh territory under Ranjit Singh). The Guptas were the general sovereigns, but from this phase onwards, there were a host of well-established regional powers, and up to the stage before the Muslim invasion, the inner Indian orbit was shared between the Pallavas and the Cholas in the south, the Rashtrakutas of the Deccan, the Gurjara-Pratiharas of north India and the Palas of eastern India. There were no doubt geographical limits to political power. At the same time, it was not very static. The lines came to be drawn and redrawn time and again within the general constraints imposed by geography.

## *Major Phases of Early Historic Economic History*

Three overlapping phases are clearly marked. We restrict our first phase to the period represented by the early Buddhist literature between *c.* 600 BC and *c.* 200 BC. The basic facts related to the economic conditions of this period were summed up by C.A.F. Rhys Davids many years ago. She began by claiming that the Indian rural economy of the period was based

on a system of peasant proprietorship, and not on a system of great feudatory estates. The kings could levy a number of taxes—all possibly in kind—the most important of which was the yearly revenue measured and administered either by the village headman or a royal official. The oligarchical/republican principalities must also have raised revenue in this way. Land could be gifted away and sold, but one is not sure if there was an individual proprietorship of land with the inalienable right to dispose of land as one wished.

Cities certainly existed, but the countryside was dotted with villages which had their own demarcating stockades or walls. Outside the stockade lay the village agricultural fields, pasture lands, and sometimes, uncleared stretches of jungles. In the agricultural fields the individual plots were marked by ditches dug for cooperative irrigation. There were large agricultural estates farmed by Brahmins, and among the crops one gets rice and other grains, sugarcane and fruits, vegetables and flowers. Agricultural pursuits had no social stigma attached to them, being practised by Brahmins, Kshatriyas and Vaisyas alike. Household slavery was known, and so also was the system of paid agricultural labour.

Professional specialization was well understood. At the head of the list should come various crafts organized under guilds, each in turn under a president. The sources specifically mention 'the woodworkers, the smiths, the leather-dressers, the painters and the rest, experts in various crafts'. Some professions were held in less social esteem than others, and in this category were included trappers and hunters, fishermen, butchers, tanners, snake-charmers, rush-weavers, etc. There were persons who specialized in acting, dancing and music, and there were courtesans who were held in great esteem. One comes across specialists in ivory-working, weaving, confectionery, jewellery and work in precious metals, bow-and-arrow-making, pottery, garland-making and hair-dressing. There were traders or merchants, caravan-guides, seamen, robbers and others. There were craft villages, and within the cities each craft had a separate area allotted to it. The crafts were not always hereditary; the exigencies of the situation certainly counted. According to Rhys Davids, the sources suggest 'freedom of initiative and mobility in trade and labour'.

Commerce was an important activity. Caravans are frequently mentioned; they passed through difficult terrains and were frequently robbed. Sea voyages were known and covered the Gulf, Sri Lanka and southeast Asia. Caravans went along the major trade routes of the period, the most important of which was from Rajagriha in Magadha to Pratisthana on the Godavari in Maharashtra. One gets references to various commodities being sold in markets: textiles, groceries and oil, greengroceries, grain,

perfumes and flowers, articles of gold and jewellery, strong liquors. There was an extensive currency system. The coin unit used was known as 'Kahapana/Karshapana'. Rhys Davids sums up:

> We have seen agriculture diligently and amicably carried on by practically the whole people. . . . We have seen arts and commerce flourishing, highly organized, corporately and locally, under conditions of individual and corporate competition, the leading men thereof the friends and councillors of kings. We have found 'labour' hereditary, yet, wherewithal, a mobility and initiative anything but rigid revealed in the exercise of it. And we have discovered a thorough familiarity with money and credit. . . .

The second phase is that of 'economy under state control'. It is unlikely to be a chronologically successive phase. The picture of a state-controlled economy in Kautilya's *Arthasastra* offers a different dimension to the economic history of ancient India, a dimension of which we are not aware in the early Buddhist sources. To some extent the testimony of the *Arthasastra* is corroborated by whatever has survived of the testimony of the contemporary Greeks (cf. Megasthenes' *Indica*). Even a skeletal summary of the contents of Kautilya's work would highlight the extent of the state's role in the ordinary life and economy of the people. Book I (21 chapters) is about the person of the king, his training and duties, council of ministers, the need for his personal safety and the engagement of spies, etc. Book II (36 chapters) is entitled 'the duties of government superintendents', beginning with the laying out of villages and forts. Revenue-collection has been categorized as the most important administrative business of the state, and the instructions in this connection are specific, detailed and thoughtful. The different sections selected for discussion are: the purity of gems for the royal treasury, the conduct of mining operations and manufacture, gold and goldsmiths' storehouse, commerce, forest produce, armoury, weights and measures, measurement of space and time, tolls, weaving, agriculture, liquor, slaughter-house, prostitutes, ships, cows, horses, elephants and their training, chariots, infantry, chief of the military forces, passports, the duties of revenue collectors, and the duties of city superintendents. Book III (20 chapters) is mostly about inheritance, forms of agreements, recovery of debts, and so on. Books IV (13 chapters) and V (6 chapters) deal mainly with crime and punishment. Books VI (2 chapters) and VII (18 chapters) are about the conduct of diplomacy in relation to other kings. Book VIII (5 chapters) is concerned with the dangers that may arise in relation to the king's power. The rest of the book (Books IX–XV) deals with the army and various ways to retain control, including a chapter on the restoration of peace in a conquered territory. It should be obvious that Book II is very important in understanding state control of the economy.

Our third phase deals with external trade in the early centuries AD. This trade was in three or four directions: towards south-east Asia, towards west Asia including the Gulf, towards central Asia and China, and finally, towards the Mediterranean and the African coast. At the height of their existence all these commercial activities were to a large extent intertwined. Although the existence of Indianized states in south-east Asia is well documented in historical records, the nature of their commercial interaction with India is somewhat obscure for the early period. However, two points may safely be made. First, such interactions existed, both by land and sea, and second, in the early centuries AD these were incorporated in the general trading network linking Rome with China. Specific archaeological sites and finds may easily be cited in favour of this assumption—the rouletted ware of Indian derivation in Bali, for instance. Beyond the Gulf trade, which was integrated with the Roman network and covered the southern coast of the Arabian peninsula on its way to the Syrian coast via Petra, India's west Asia trade of the period was along the caravan routes through north and south Iran. Both this and the central Asiatic trade passed through Afghanistan where Begram at the southern foot of the Hindukush has yielded breathtakingly beautiful traded items, and Balkh on the northern side of the Hindukush is still awaiting a major excavation. The central Asiatic trade also went over the Karakoram via the Pamirs and Ladakh, and when, under the Kushanas, central Asia and a large part of northern India constituted a single political unit, the snowy heights of the mountains provided no barrier to the movement of the merchants and the monks. Archaeological relics abound all along these routes and formed the staple of Aurel Stein's discoveries in central Asia.

The details of the Roman trade are known from various Roman sources, principally the Periplus of the Erythraean Sea, a nautical almanac composed in the first century AD, which lists Indian seaports and goods traded through them. Archaeological evidence is generally in the form of thousands of Roman gold, silver and (occasionally) copper coins, sent possibly as metals. Pottery and other objects occur in a comparatively limited quantity. At the other end, Indian ivory work has turned up in Pompeii, and epigraphical records of Indian merchants have been recorded in Alexandria in this period. Both Latin and Indian literature refer to these contacts which were partly overland and partly maritime.

The Indian sources highlight the fact that there was considerable expansion of agriculture and craft and related organizations in the early centuries AD. We visualize a main flow of the internal produce and the related economic structure from the earliest period, which was enriched by a large volume of inland and external trade in these times.

## SETTLEMENT CONTEXTS[3]

### *The North-west*

The main units of study are the Peshawar plains, the area to its east and north-east up to Chitral, the plains of Kohat and Bannu and the Potwar plateau. The Peshawar plains are about 6400 sq km of semi-circular lowlands covered by spreads of gravelly or alluvial detritus. The Kabul river meets the Indus at the eastern edge of the plain and the Swat river meets the Kabul in the plain itself. Agriculture is largely dependent on irrigation, the annual rainfall being 160–240 cm. The main areas between Hazara–Malakand and Chitral are, from the east to the west, Hazara, Buner, Swat, Dir and Chitral. The hills cascade from the 7,580 m high Tirich Mir in Chitral down to 1500–1800 m high ranges in Malakand and other areas which skirt the plains. The ranges have a NE–SW trend and deep narrow valleys between them. The main river is the Swat (arable land on either side in narrow strips), but the Kunar comes down from Chitral and moves into Afghanistan to join the Kabul. Kohat has about 260 cm of annual rainfall, but there are springs in the limestone formations of the area. The Tochi and the Kurram are the main rivers in Bannu which has an annual rainfall of 180 cm. Wool is an important product of both Kohat and Bannu. The Potwar plateau lies between the Indus and the Salt range, with an area of 10,000–13,000 sq km and an annual rainfall of 250–400 cm. Raw materials are very sparse in the whole region: some iron and antimony in Chitral, and salt mines in the Salt range. Many trade routes pass through the region, the Khyber being the best known, but there are also other lower passes from the Kunar into Dir and Swat. The Karakoram route to central Asia through Chitral, Hunza, Gilgit and the Pamirs is well known too and shows an enormous range of rock paintings and engravings along the way, especially in the Gilgit sector. Early historical inscriptions too are many and contain in some cases such personal statements as 'Jivachandra went this way' or 'there was a priest called Kirtibhushana'. Northeastern Afghanistan, the lapis lazuli country, can also be approached from Chitral. From the Potwar plateau one can travel easily to Kashmir, and from Bannu one can follow the Tochi and Kurram alignments into Afghanistan. On the Indian side the Indus system goes down to Sind, and Delhi is easily accessible along the Punjab piedmont.

The early historic sites of the north-west, which embody the long historical sequence of the area from the Achaemenids to the Sassanids and Hindu Shahis, are mostly settlement sites and Buddhist stupa and monastic sites. The latter category of sites occurs both in the plains and on the hill

slopes and tops of the valleys through which the trade routes pass. Between 1915 and 1920, the Archaeological Survey of India reported 397 sites in the Peshawar area, and recently Ihsan Ali of Peshawar University found 1228 multi-layered sites in the Peshawar plains. A number of excavated stupa sites of this region are famous: Takht-i-Bahi, Shahri Bahlol and Shahji-ki-Dheri, which are all in the Peshawar plains, and Manikyala in the Potwar plateau. In Bannu the major historic site is Akra (200+ acres, possibly the capital of an Achaemenid satrapy) which yielded Indo-Greek coins. In the Peshawar plains Charsadda and Hund are the major mounds while Taxila is an important site in the Potwar plateau. The ruins of Charsadda or the ancient city of 'Pushkalavati' are spread over 10 sq km and two major mounds: Bala Hissar and Shaikhan Dheri (600 m north–north-west of Bala Hissar). The Bala Hissar stratigraphy begins basically with the Achaemenids, and when the Greeks under Alexander laid siege to it, the Bala Hissar citadel enclosed an area of 15 acres with a 5 m wide mud rampart and a 4.5 m wide and 3 m deep moat. The Shaikhan Dheri stratigraphy runs from the middle of the second century BC to the close of the second or the middle of the third century AD. This grid-patterned city was founded by Menander and it declined after the Kushanas. The city plan, of which three parallel streets and a side-street crossing at a right angle have been excavated, belongs to the Kushana period. The occupational area of Taxila or ancient 'Takshasila' is divided into three mounds—Bhir, Sirkap and Sirsukh—in three different parts of the valley and spans the sequence from the Achaemenids to the Kushanas. About 3 acres of mostly Mauryan remains have been unearthed in the middle of the Bhir mound: irregular plan, four streets, five lanes and associated house blocks. One street was 6.6 m wide and the rest 2.7–5 m. The houses had open courtyards, and in one case the ground floor had 15 to 20 rooms. The enclosing stone wall of Sirkap (to the north-east of the Bhir mound) was 5 km long, 4.5–6.5 m wide and 6–9 m high. It was strengthened by berms and rectangular bastions. The only excavated gateway is the northern gateway which has a hall. For a length of about 600 m the Indo-Parthian level of the city has been excavated, showing a grid plan, houseblocks interspersed by stupas and temples. One house covered 2160 sq m and the existence of a 'palace' has been inferred in the south-eastern extremity of the excavated remains. The third city, Sirsukh, came up towards the close of the first century AD and a masonry rampart wall with bastions enclosed a space of $1350 \times 990$ sq m. In the hills bordering Taxila there were many Buddhist remains, the most important of which is the Dharmarajika stupa founded by Asoka.

*Kashmir, Punjab, Himachal Pradesh, Sind*

Kashmir is a narrow valley hemmed in by high mountain ranges on all sides, and thus the issue of routes is important in this context. The north-eastern flank is marked by the Himalayas (the dominating peak in this sector: Nanga Parvat, 8126 m high) and the south-western by the Pir Panjal range (maximum height 500 m, length 240 km, width 105 km). Three major approaches to the valley from the plains are the Banihal pass (from Jammu), Baramula pass (from Rawalpindi) and Pir Panjal pass (from Gujrat in Pakistan). The routes from the valley to central Asia emanated from Gilgit in the west and Leh in the east. From Gilgit one goes to Yasin and from Yasin to Taghdumbash Pamir across the Darkot, Baroghil and Wakjhir passes. From this area there is a direct route to Kashgar across the Chichiklik plateau. From Yasin one can also go to Mastuj and Chitral. With Yarkand as the objective one has a choice of three passes after Hunza: Shimsal, Khunjerab and Mintaka. From Leh the target was Yarkand, 825 km by 'summer route' across the Karakoram pass. There is a 'winter route' as well through a few other passes, but the most important and easy route between Leh and Yarkand is through the Changchenmo valley. Skardu, the centre of Baltistan between Gilgit and Leh, also provided an access to central Asia through Saltoro glacier. Further, Tibet is approachable from Ladakh, mainly along the Indus. Apart from the temple ruins, the early historic archaeological evidence from Kashmir is nothing more than the stratified sequence at Semthan beginning with the NBP, the excavated apsidal temple with a rectangular antechamber at Harwan (*c.* AD 300), the Kushana period inscription at Khalatse bridge on the Kashmir–Ladakh route, and the 'Dard graves' of Ladakh (? AD 1 to 500). No site has been excavated in detail and properly published.

A recent survey in mainly the eastern part of Pakistani Punjab has identified about 130 sites dated between the first and seventh centuries AD. No details are yet published but the distribution map suggests a general concentration east of the Chenab. At Tulamba near Multan the large basic site contains an inner mound of square shape and its first two periods ranged from the sixth to fifth century BC to the third century AD. In Indian Punjab Madhu Bala gives a district-wise list of 229 sites—Amritsar: 35; Bhatinda: 32; Hoshiarpur: 12; Gurdaspur: 32; Ludhiana: 33; Patiala: 43; Ropar: 9; Sangrur: 13; and Jalandhar: 20. Detailed explorations should reveal more but as of now nothing else is known even about the published ones except their names. Rupar, located at the point where the Sutlej enters the plains, has NBP and somewhat later, a retaining wall of a large tank with an inlet to bring rain water to the tank. Sanghol in Ludhiana has a mud fortification and three concentric moats around.

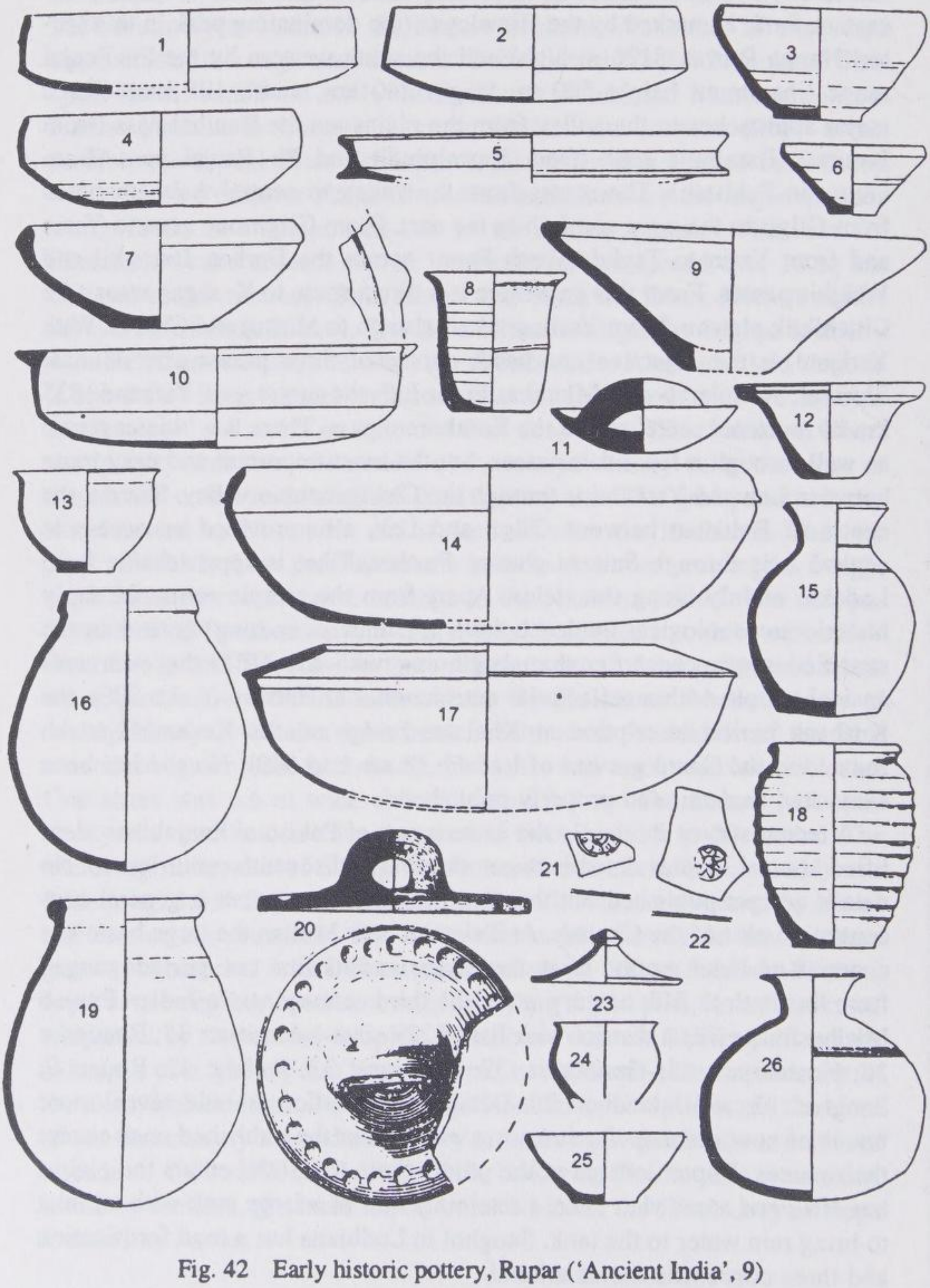



Fig. 42 Early historic pottery, Rupar ('Ancient India', 9)

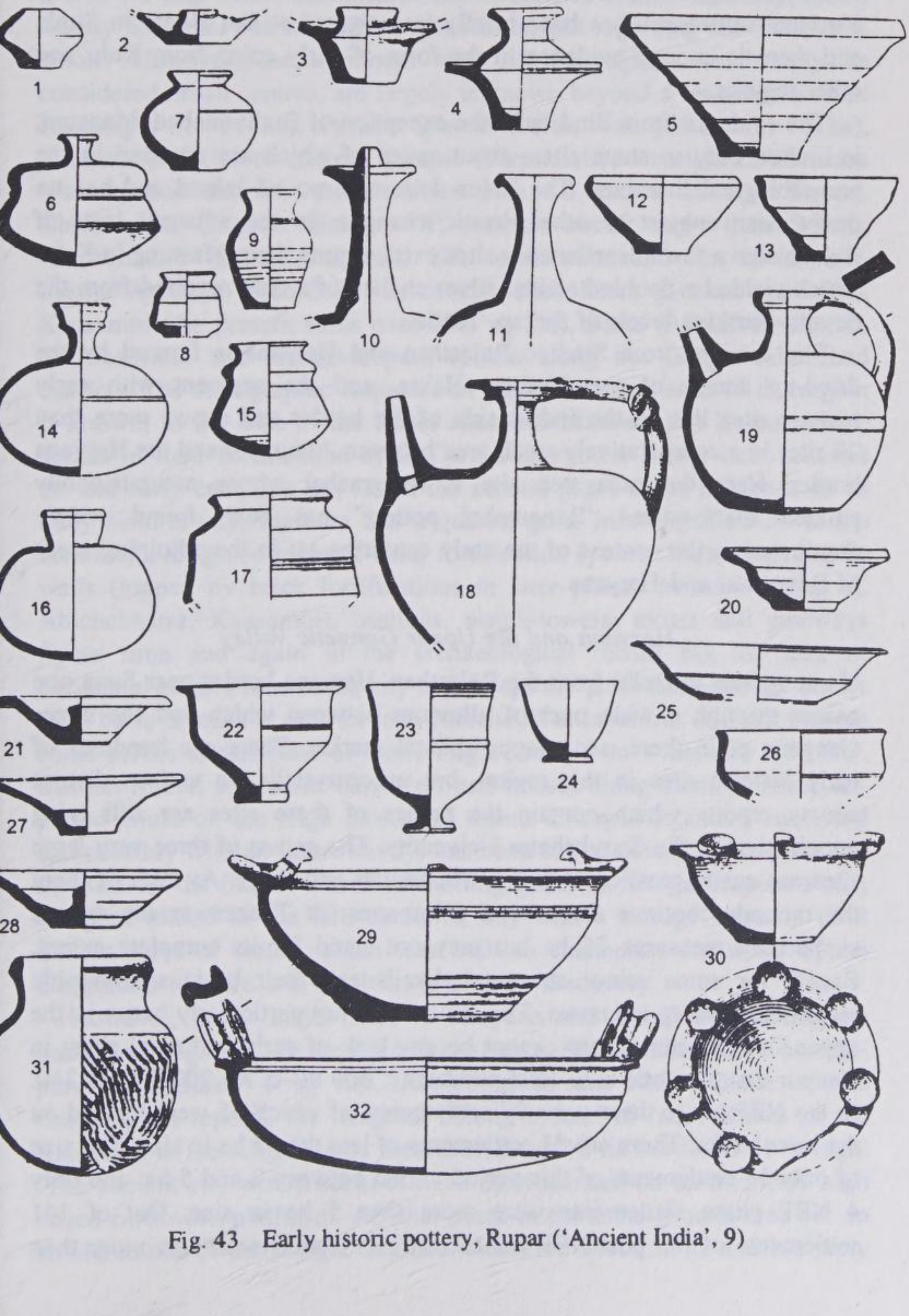



Fig. 43 Early historic pottery, Rupar ('Ancient India', 9)

No major early historic site has yet been excavated in modern Himachal Pradesh, although there is no doubt about the existence of such sites there. Pottery dating from *c.* 200 BC has been noted at Ror in Kangra. An 'urban Kushana settlement' has been briefly investigated at Dat Nagar in Simla and there is enough evidence in the form of early coins from Kulu and other regions.

The evidence from Sind, with the exception of Brahminabad–Mansura, is limited only to stupa sites, about seven of which are reported in the archaeological literature. The Indus delta has moved inland and has no doubt been subject to other drastic changes. In the adjacent tract of Baluchistan a few miscellaneous sites exist, among them Mastung in Kalat which yielded a double-handled silver chalice of a type reported from the Scytho–Parthian levels of Sirkap, Taxila.

The corridor from Sind to Rajasthan and Haryana is formed by the dried-up course of the Ghaggar–Hakra, and the segment with early historic sites lies on the Indian side of the border and shows more than 20 sites in a comparatively small area between Anupgarh and the Haryana border. Here the excavated site is Rangmahal whose naturalistically painted black-on-red 'Rangmahal pottery' has been found widely distributed in the context of the early centuries AD in the adjoining areas of Rajasthan and Haryana.

### *Haryana and the Upper Gangetic Valley*

If one travels to Delhi from the Rajasthan–Haryana border near Sirsa one passes through a wide tract of alluvium between which and the upper Gangetic plain there is no topographical marker. There are hundreds of early historic sites in this region, but unfortunately the various district survey reports which contain the names of these sites are still lying unpublished in the Kurukshetra University. The names of three very large sites are easily recalled: Agroha, Thaneswar and Sugh. At each of them the mounds continue for several kilometres; at Thaneswar the mound supposedly measures 75 ha but may not stand for its complete extent. Except for some minor structural details and their basic stratigraphic sequence, nothing is known. The situation is not particularly better in the upper Ganga plain. There cannot be any lack of early historical sites; in Kanpur district alone their total number (*c.* 600 BC–*c.* AD 200/300) is 240. In the NBP phase there were 99 settlements, of which 65 were located on the river banks. There are 81 settlements of less than 2 ha in size. The size of only 14 settlements of this period varied between 2 and 5 ha, and only 4 NBP phase settlements were more than 5 ha in size. Out of 141 settlements of the post-NBP period, only one settlement was more than

10 ha in size. Most of them measured below 2 ha. The average spacing of settlements in the NBP phase was 9 km, and for the post-NBP phase it was 7.5 km. These data apply only to Kanpur district and may not be wholly accurate, but still offer a general insight regarding the Doab as a whole. However, the dominant sites of the region, which may be considered urban centres, are largely unknown beyond a few known sites: Hastinapur (*c.* 31 ha), Purana Qila in Delhi, Atranjikhera (*c.* 46 ha), Mathura (360 ha or more), Kampil (Farrukhabad district, UP),Sankisa (Farrukhabad district, rampart more than 5.5 km in circuit), Kanauj, Chakranagar (Etahwa district, UP, rampart circuit more than 5 km), Ahichchhatra (Bareilly district, UP, fortification 5.6 km in circuit), Saketa–Ayodhya (4 to 5 km in circuit), Hulaskhera (Lucknow district), Kausambi (the present ruins over 20.5 sq km), Bhita (Allahabad district, UP, fortified) and Sringaverapura (1 km along the Ganga, Allahabad district). The stratigraphic sequence of these and other sites of the region is known; in the case of the major sites like Mathura and Kausambi the details of their fortification system are also known. In the late centuries BC and early centuries AD, i.e. in the second phase of its existence as an early historic city, Mathura had a quadrangular inner fortification in the centre of a longish crescentic outer fortification system. High mud rampart walls (topped by brick fortifications in later phases in some cases, cf. Ahichchhatra, Kausambi), bastions, watch-towers, moats and gateways figure time and again in the archaeological record but the lack of horizontal excavations in the city area keeps the present knowledge on the most basic level. It is only in John Marshall's excavations at Bhita that we come across streets (one of them, High Street, 9 m wide, and the other, Bastion Street, somewhat narrower) and houses along them. A Mauryan-period house on the High Street (12 rooms arranged around a courtyard and possibly with an upper storey) has been called 'house of the guild' on the basis of the find of a seal mentioning guild. At Sringaverapura a tank complex (dated in the late centuries BC) with a storage capacity of 2 million litres of water, which was built to channelize the water of the Ganga and to store and desilt it, is a major discovery.

However, many major sites in Haryana and the Doab possibly lie unknown or ignored. In the Bulandshahr area, Ahar (ancient 'Tattvananda-pura'?) measured 4 sq km. According to the 12th volume of the Cunningham reports, the irregular oblong mound of Indor Khera on the Kali Nadi in the Aligarh area measured about 10 ha but stood 21 m high. 'The ancient city would seem to have been situated on an interiorly high raised earthwork platform.' Another place in the same general area but on an old course of the Ganga, Sankara, measured about 55 ha and is simply

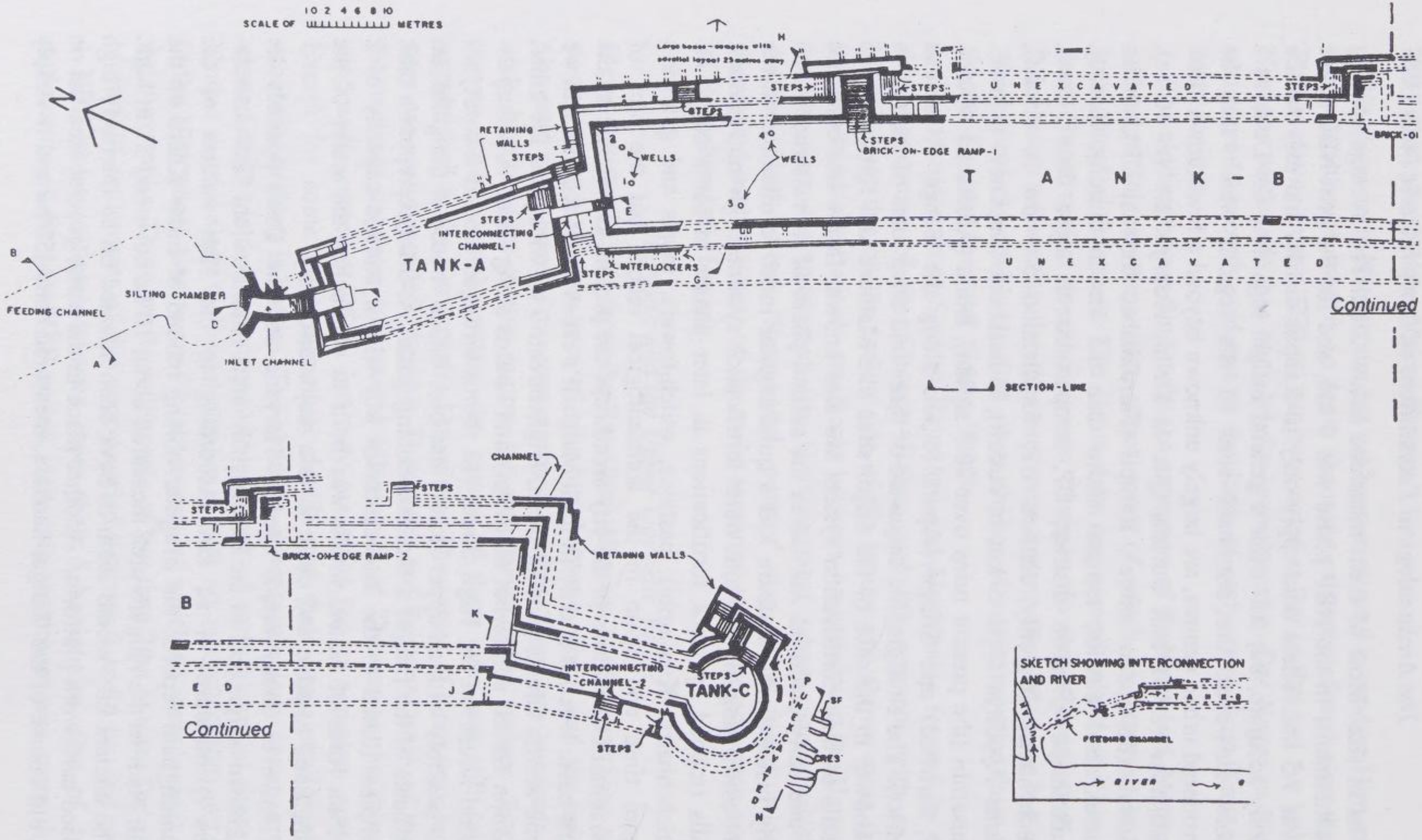






Fig. 44 Sringaverapura tank (Lal, 1993)

a high steep-sided, flat-topped earthwork, or a sort of lofty table-topped plateau of earthwork which never had any kind of raised rampart whatever along its edges, but seems to have depended principally on height and steepness for means of defence.

### *The Middle Gangetic Valley and the Trans-Sarayu Plain*

This region includes eastern UP and Bihar. There is a plethora of detailed exploration reports on eastern UP, either district-based or based on a small river valley. In old Basti district, which included the modern Domariyaganj and Siddharthanagar areas, there are 165 sites, many of them multi-layered and early historic. In the trans-Sarayu region as a whole, Sravasti (rampart circuit *c.* 8 km) is the most important site, of which very little has been excavated except monastic ruins. The Piprahwa-Ganwaria complex, proved to be ancient Kapilavastu, is a much smaller site and here too only the religious remains have been excavated. However, this region 'could boast of a large number of smaller urban sites with an average size of 20 to 25 acres or more'. The inscriptionally known Maurya administrative centre of Sohgaura and the glass-manufacturing fortified site of Kopia, both on the Ami river, belong to this category. In modern Ballia district 12 sites showed NBP whereas 20 sites belonged to the late centuries BC–early centuries AD bracket. In the middle Gomati valley, which covers much of Sultanpur district, there is a steady progression in the number of sites from *c.* 600 BC to *c.* AD 300; in the early centuries AD the number is 84, whereas between *c.* 600 and *c.* 300 BC it is a little more than 10. Apart from Rajghat or modern Banaras, there are at least five fortified city sites in the Ballia–Banaras sector: Pakka Kot, Khairadih, Nahush-ka-Tila, Masaon Dih and Bairant. Some unfortified sites too can claim urban status because of their large size (cf. Nal-ka-Tila, Robertsganj). The beginning of fortification at Rajghat is *c.* 600 BC.

In the broad sweep of north Bihar, detailed survey reports are lacking, but the fortified sites are: Manjhi (a Bhita-type site, badly excavated), Katragarh (Darbhanga sector), Vaisali, Kopagarh, Balirajgarh (the last two in Madhubani), Mangalagarh (Samastipur), Naulagarh and Jai Mangala Garh (both in Begusarai). Fortification walls have been excavated at Katragarh and Balirajgarh but there has been little progress beyond them. In south Bihar, the major sites are Chausa, Buxar, Deo Umga (?), Bodh Gaya and Devangarh, in addition to the already well-known ones of Rajagriha, Pataliputra, Sonpur and Champa. Devangarh is a fortified urban site to the south of Rajgir whose outer cyclopean masonry wall on the hill tops is famous, but one cannot be sure of the relationship between 'old' and 'new' (fortified) Rajgirs. The timber pallisade and the stone-pillared

hall of Pataliputra echo Megasthenes' description of the place, but these lie in the periphery of the settlement and not in the core, which lies untouched. Champa (the Nathnagar locality of modern Bhagalpur), the capital of Anga, was a most impressive site—a high, artificially formed table-top plateau with enclosing fortification, which overlooks the long and narrow stretch of ancient occupation in the narrow strip of ground on the bank of the Ganga.

### *Assam and the Northeast, the Padma-Bhagirathi Delta (Bangladesh–West Bengal) and Orissa*

There is no positive evidence of early historic occupation as yet in the Brahmaputra valley and the north-eastern region as a whole. But this has more to do with the lack of excavations in the region than with real absence. Tezpur seems to have yielded some early pottery on the surface but there has been no systematic excavation at this site. Claims have been made for the late centuries BC level in Meghalaya and Manipur, but more work is necessary. There are two major early historic sites in Bangladesh: Mahasthangarh or ancient 'Pundranagara' (*c.* 185 ha, fortified) on the bank of the Karatoya river in northern Bangladesh and Wari-Bateshwar at the mouth of the Meghna delta. Both these sites had links with the Brahmaputra valley. In northern West Bengal, there is only one fortified early historic site, Bangarh. In the Bhagirathi delta, along an old course of the Ganga below Calcutta and along the Midnapur coast there are quite a few urban sites, the most important of which are Chandraketugarh near Barasat and Tamralipta (modern Tamluk). Most major sites have, however, remained unexcavated. This belt must have catered to both Roman trade and south-east Asian trade in the Bay of Bengal. In addition to these deltaic sites, there are a few more early historic urban sites in West Bengal: Kotasur (fortified) in Birbhum, Mangalkot on the bank of the Ajay in Burdwan, Pokharna on the southern bank of the Damodar and Dihar on the bank of the Dwarakeshwar. All these sites have been marginally excavated. In Orissa, the fortified early historic sites are Sisupalgarh (near Bhuvaneshwar) and Jaugada, further down the coast. Early historic evidence occurs elsewhere too, and a significant discovery of recent years is that of Radhanagar (brick fortification enclosing 6 sq km) on the bank of the Keluo, a tributary of the Brahmani near Jajpur. This has been identified with 'Dantapura', a capital city of ancient Kalinga.

### *Andhra, Karnataka, Kerala and Tamil Nadu*

The main focus is on the Krishna–Godavari delta and the adjacent uplands which played a role in both maritime and internal trade. There are a large

number of early historic Buddhist monastic sites in this region, and among the major excavated settlement sites are Nagarjunakonda among the hills on the Krishna (a fortified citadel, a residential area with a stadium, and many temples and stupas on the river bank), Satanikota on the Tungabhadra in Kurnool (rampart, moat, gate), Dhenukataka near Amaravati, and Kondapur. There are also other marginally explored and excavated sites. In Karnataka, the largest site seems to be Sannati (*c.* 200 ha, brick fortification, rich in Buddhist relics) but sites like Udayavara (near Udupi), Banavasi (north Kanara), Vadgaon–Madhavpur (Belgaum district) and Isila (Brahmagiri in Chitradurg) deserve attention. Isila was a Mauryan provincial centre. Roman references to coastal sites in Kerala notwithstanding, nothing early historic has yet been identified and documented in Kerala.

K. Rajan's work in Tamil Nadu has thrown up some extremely important early historical evidence in that region in recent years. The focus is mainly on the area between the Palar and Vaigai–Tamraparni rivers. The archaeology of this region has hitherto been dominated by Roman trade, as evidenced at Arikamedu near Pondicherry, and megaliths. The antiquity of the Roman trade with this region has been pushed back to the last two centuries BC, with its peak between 50 BC and AD 50 on the basis of recent excavations at Arikamedu. Another port site of the region, Kaveripattinam, has its first period dated between the third century BC and first century AD, and during this period it had successively a wooden boat jetty and a brick-built wharf. Rajan has demonstrated that the myriads of megalithic sites in this area are associated with settlements, some of which are fairly large, up to 50 acres. He points out that the Pandya and Chera kings were issuing inscribed coins as early as the third century BC and also draws attention to the large-scale occurrence of post-firing graffiti on pottery, which, according to him, suggests a clear connection between these graffiti and the Tamil–Brahmi script which appears later. In fact, he claims that 'in the present level of knowledge one should consider these marks as an undeciphered script.' Rajan argues that at the excavated site of Kodumanal the Tamil–Brahmi script goes back to the third century BC and that its standardized form and grammar during this period suggests its still prior development. In this sense the mid-first-millennium BC date of the Brahmi script at Anuradhapura makes sense, and the same date may cogently be applied to the beginning of the Tamil–Brahmi script in the Kaveri delta and elsewhere in Tamil Nadu. Finally, Rajan's excavations at Kodumanal have demonstrated the extent and richness of raw material extraction and processing (cf. Beryl, iron and steel) and thus the presence of trade, possibly well before the third century BC. Moreover, he argues for a close interaction with north India at this stage, mostly in the very presence of the

Brahmi script and such items as carnelian beads which were not available locally. According to Rajan, 'it all suggests that the foundation for the emergence of the state would have been laid down at least in the fifth century BC.' Thus, we are confronted with the distinct emergence of early history in the Kaveri delta as early as the fifth century BC.

### *Maharashtra, Madhya Pradesh, Gujarat and Rajasthan*

It is around this period and later that Maharashtra passes into early history at places like Nasik, Brahmapuri, Paithan, Ter, Kaundanpur, Bhokardan, Adam and others. Rampart and moat exist at most of these sites. Another major site is Sopara on the Konkan coast. Many Maharashtra sites, especially those in the interior, are linked to the internal trade routes directed towards the coast for maritime trade. Apart from Malhar in Bilaspur district in the Chhattisgarh sector, the major early historic sites of Madhya Pradesh are scattered in its Malwa region: Ujjayini, Vidisa and Pawaya. Rampart at Ujjain goes back to *c.* 600 BC, and was 73.5 m broad at the base and 132 ft wide at the top, protected by well-cut and well-laid wooden logs (teak and Safed khair) for about 105 m along the river to prevent the bank from getting scoured by the river-action. Vidisa was fortified too, and if Ujjayini was the chief city of Avanti or western Malwa, Vidisa was the chief city of Akara or eastern Malwa. Not much is yet known about early historic Gujarat. Excavations at Broach, a port town at the mouth of the Narmada, Shamlaji (brick fortification), etc. have given an idea of the sequence which begins with the NBP and earlier pottery. Nothing else of significance is known except the fact that the ancient Gujarat ports must have been major players in the Roman trade. There are only four reported major early historic sites in eastern Rajasthan: Rairh, Sambhar, Nagari and Bairat. Nagari and Bairat were fortified and certainly go back to the third century BC and somewhat earlier.

## INSCRIPTIONS

### *The Antiquity and Variety of Scripts*

There are two main varieties of scripts in early historical India: Brahmi and Kharoshthi (written also as Kharoshti and Kharoshtri but 'Kharoshthi' is the commonly used term). The Kharoshthi script was limited only to the north-western part of India. When found outside this region, this has to be interpreted in terms of the presence of Kharoshthi-writers in the territory concerned. The earliest documented use of this script is in the Asokan edicts and the most recent examples date from the fourth–fifth centuries AD. The use of this script was thus comparatively short-lived. Its origin is

possibly rooted in the Aramaic script introduced during the Achaemenid rule of north-western India, and the theory is based on the likeness of many signs having similar phonetic value and the direction of writing from right to left. However, two points may be noted. First, certain signs were borrowed, certain signs derived and certain signs added. Second, the probability of its being earlier in the interests of the Achaemenid administration need not be denied.

The 'Brahmi' script has a pan-Indian distribution, lies at the roots of the major modern Indian scripts and has even influenced some scripts in central Asia, Tibet and south-east Asia. When it first appears in the Asokan inscriptions it has wide variations in the form of letters, which have been explained as local varieties: Northern and Southern, and the presence of cursive and advanced forms of letters. The general consensus is that the Brahmi script began before Asoka. Literary evidence of all kinds suggests that the antiquity of the script in India goes back at least to the eighth/seventh century BC, a date which fits in well with the date of the beginning of NBP as the archaeological marker of early historic period in the Gangetic valley. Now that we know that the tradition of Indian writing continued in the late Harappan stage down to *c.* 1300 BC, the time-gap between the end of the Indus civilization and the beginning of early history is less than what used to be thought before. Besides, as we now know that the Harappans closely interacted with the neolithic–chalcolithic communities outside their distribution area, it may not be illogical to think that the Indus writing tradition lingered on in perishable medium till the dictates of the new socio-economic contexts of early historic India led to its resurgence in a changed form. The earlier notion that the idea of alphabetic writing was adopted in Brahmi from the Aramaic has academically nothing to recommend, despite its resurgence in a new form after the discovery of some potsherds with fragmentary Brahmi inscriptions in contexts dated *c.* 450–350 BC at Anuradhapura in Sri Lanka. This discovery only confirms that the archaeological evidence of the Brahmi script is earlier than what was thought and that the many Tamil–Brahmi inscriptions found in south India should be equally early.

## *Contents and Styles of Early Inscriptions*

### *Mauryan and Post-Mauryan*[4]

The earliest recorded instances of historic inscriptions, i.e. the inscriptions of Asoka, have been found, category-wise, at the following places (unless otherwise stated, the script is Brahmi):

TABLE VII.1

*Recorded Instances of Asokan Inscriptions*

| | |
|---|---|
| Major rock edicts—RE (total number 14) | Dhauli (near Bhuvaneshwar, RE 1–X, XIV Separate Edicts I–II), Jaugada (Ganjam, Orissa RE I–X, XIV Sep. E I–II), Kalsi (Dehradun, UP RE I–XIV), Girnar (Junagarh, Gujarat, RE I–XIV), Sopara (north of Bombay, portions of VIII, IX), Erragudi (Kurnool, Andhra, RE I–XIV), Shahbazgarhi (Mardan, NWFP, in Kharoshthi, RE I–XIV), Mansherah (Hazara, NWFP, RE I–XIV), Kandahar (Afghanistan, in Greek, RE XII–XIII), Sannati (Gulbarga, Karnataka, RE XII, XIV and a Sep. E replacing RE XIII). |
| Minor rock edict I | Maski (Raichur, Karnataka), Gavimath (Kopbal, Raichur), Palkigundu (Kopbal), Srinivaspuri (Delhi), Bairat (Jaipur, Rajasthan), Ahraura (Banaras, UP), Gujarra (Datia, MP), Sasaram (Bihar), Panguraria (near Hoshangabad, MP) |
| Minor rock edicts I and II | Rajula-Mandagiri (Kurnool, AP), Erragudi, Udegolam (Bellary, Karnataka), Nittur (Bellary), Brahmagiri (Chitradurg, Karnataka), Siddapura (Chitradurg), Jatinga-Ramesvara (Chitradurg). |
| Major pillar edicts—MPE total number 7 | Topra (Ambala, Haryana, PE I–VII), Meerut (UP, PE I–VI), Lauriya-Areraj (Betiah, Bihar, PE I–VI), Lauriya-Nandangarh (Betiah, PE I–VI), Rampurwa (Betiah, PE I–VI) Kosam (Allahabad, PE I–VI), Kandahar (in Aramaic, PE VI), Buner or the area of Takht-i-Bahi (NWFP, PE VI). |
| Minor pillar edicts—MPE | Kosam (Queen's Edict), Kosam (Schism Edict), Sanchi (Schism Edict), Sarnath (Schism Edict), Lumbini (Nepalese terai), Nigali Sagar (near Lumbini), Amaravati (Andhra) |
| Individual rock inscriptions | Bairat, Barabar (near Gaya, Bihar) |

In addition, bilingual Greek and Aramaic inscription resembling MRE I from Kandahar, and Aramaic inscriptions from Taxila (resembling RE IV), Pul-i-Darunta (Afghanistan, quotations from Asokan edicts), Laghman (Afghanistan, two separate inscriptions, both mentioning 'Priyadarsin', a name of Asoka).

A brief allusion to the contents of Asokan inscriptions may be offered on the basis of E. Hultzsch's *Corpus Inscriptionum Indicarum*, volume I (1925).

TABLE VII.2
Content of Asokan Inscriptions
(after E. Hultzsch, 1925)

| | |
|---|---|
| RE I | no 'festival' meeting—no killing of living beings—reference to two peacocks and one deer being daily killed in the royal kitchen, but even this has to be stopped. |
| RE II | the Cholas, Pandyas, Satiyaputras and Keralaputras as 'borderers'—Antiochus II Theos of Syria, 261–46 BC—medical treatments for men and beasts—trees to be planted and wells to be dug on the roadsides. |
| RE III | royal officials and their tours, also council of ministers. |
| RE IV | propagation of morality—morality defined. |
| RE V | minister of morality—'western borderers'. |
| RE VI | reports by agents to him at all hours. |
| RE VII | desires that all sects may reside everywhere. |
| RE VIII | visit to Bodh Gaya. |
| RE IX | women practising many and various vulgar and useless ceremonies. |
| RE X | importance of morality. |
| RE XI | morality. |
| RE XII | sectarian or religious tolerance. |
| RE XIII | Kalinga war—Ptolemy II Philadelphos of Egypt 285–247 BC, Antigonus Gonatus of Macedonia 276–239 BC, Magas of Cyrene 300–250 BC and Alexander of Epirus 272–255 BC or more probably, Alexander of Corinth 252–244 BC. |
| RE XIV | rescripts of morality. |
| MRE | reference to his conversion to Buddhism and the Buddhist church; reference to 'Jambudvipa' in the sense of 'India' in the Sasaram version; reference to some Buddhist religious texts in the Bairat version; reference to a scribe, Chapada, in the Brahmagiri version. |
| Sep. E | basic theme Kalinga war. |
| PE I | 'day and night' promotion of morality. |
| PE II | precise definition of morality. |
| PE III | sins defined. |
| PE IV | a category of officials. |
| PE V | lists of animals, birds, fishes, etc. for conservation measures and no needless destruction of forests. |
| PE VI | honour to all sects; |
| PE VII | measures to teach morality. |

Other pillar edicts: 'Queen's edict'—'Karuvaki', the second queen—her gifts to be registered in her name; Kosam, Sarnath and Sanchi PEs concerned with disciplining Buddhist church; Lumbini: records his visit; Nigali Sagar: enlargement of a stupa.

Three inscriptions of the Barabar caves are relevant: two recording dedication of caves to the 'Ajivika' sect and the third dedicating a cave for shelter during the rainy season.

On the whole, these inscriptions are non-political, concerned with Asoka's concept of morality or 'dhamma' and eagerness to tell his subjects about it. Whatever historical information can be gleaned from them is only incidental. At the same time, the tone of these inscriptions is assured. The monarch was completely secure in his domain, and there is an easy knowledge of the world up to Egypt and Greece.

The post-Asokan inscriptions of the late centuries BC and a little later undergo a sea-change and record mostly the gifts of various ordinary classes of people towards the construction of Buddhist stupas. It is for the first time that ordinary people of ancient India declare themselves directly to us, appearing in all guises: monks, lay teachers, wives, daughters, merchants, bankers, artisans, blacksmiths and others. The names are all familiar and still around us. A distinct secular note is struck by the Jogimara cave inscription (Surguja, MP) which declares that a temple-servant, 'Sutanuka' ('the well-limbed one'), was loved by a scribe/sculptor, 'Devadinna' of Banaras.

### *Inscriptions of the Early Centuries AD*[5]

As an inscription of the early centuries AD one may cite the Junagadh rock inscription of Rudradaman and the Nasik cave inscriptions of Ushavadata, both distinctive in their own ways. The Rudradaman inscription is on the Girnar hill and dated mid-second century AD. The aim was to record the restoration of the lake Sudarsana which was originally constructed during the reign of Chandragupta Maurya by his provincial governor, Pushyagupta of the Vaisya caste and was adorned with a conduit during the reign of Asoka by his provincial governor 'yavana king' Tushaspha. It was destroyed in a storm during the reign of Rudradaman and the restoration work was carried out by his provincial governor, Suvisakha, a Parthian whose father's name was Kulaipa. How a man in the mid-second-century AD could make references to the history of this lake stretching back to the late fourth century BC is not known; obviously there was a system of record-keeping on perishable materials in ancient India, which has not reached us. This impression is further accentuated by the Nasik cave inscriptions 10 and 12 of Ushavadata, the son-in-law of the Kshatrapa king of western India, Nahapana, of a somewhat earlier period. The list of the royal son-in-law's munificence, as listed in Nasik cave inscription 10, is most impressive and extended down to the 'giving of eight wives to Brahmanas' at the religious centre of Prabhasa in Saurashtra and the establishment of free ferries by boats on a number of rivers including the Tapti. In inscription 12, among other things, he invests a large amount of money in a weavers' guild and arranges for the upkeep of monks in this cave at

Nasik out of the accrued interest: 'all this has been proclaimed and registered at the town's hall, at the record office.'

The inscriptions dating from the Kushana rule conform to the pattern. A two-line inscription engraved on the pedestal of an image (possibly) from Mathura records that this Buddha image which was sculpted by Visasvin was the gift of Raha, the wife of a ploughman, in the fourth month of 'hemanta' or winter season of the year 50 of the reign of 'son of god', Huva or Huvishka. One of the earliest Tamil-Brahmi inscriptions found in the rock-cut caves of Arittapatti or Mangulam in the Madurai area reads, in T.V. Mahalingam's translation, the following: 'Yaka Siti, the daughter of a citizen of Velladai, caused to be made (this cave) and Cattan Pinakkan had it cut.'

Epigraphy is, no doubt, a specialized branch of study concerned with the actual style of the script used, the language, the meaning of technical terms, the analysis of the information contained in the context of what we already know of the period and of its kings, and a host of such other issues. At the same time, inscriptions are also the most direct, and, in many cases, individually identifiable messages from the past to us. The style of the engraved letters can also be a chronological marker, but—it has to be emphasized—only within a broad period.

## Coins

Principally, two types of coins first appear in the early historic Indian archaeological record: punch-marked silver and copper coins and uninscribed cast copper coins. The punch-marked coins were made by imprinting symbols on the obverse and reverse of these coins by individual punches. These coins were made mostly of silver and, in a much lesser quantity. of copper. The weight system was linked to the weight of a particular type of seed, which was expressed as *rati* or *ratti weight*. A 100 ratti weight is known as *satamana* and a 32 ratti weight as *karshapana* or *kahapana*. The first measured between 10.4 and 11.7 grams and the second between 3.33 and 3.74 grams. Elongated sheets of silver and copper were taken out and cut into pieces of approximate weight before they were made to conform to the proper weight system by clipping edges off them. Punches were impressed by separate dies at a single point of time and not by different dies at different times. The punched symbols include a singularly wide range of motifs: geometric patterns, plants, weapons, minuscule representations of humans, and some animals like elephants, hares, bulls, dogs, etc. These motifs are said to run into several hundred varieties.

According to P.L. Gupta, one of the most celebrated numismatists of modern India.

> They were used with some definite system. Each of the symbols is found confined to the coins of a particular area or on those of a particular variety or type. Thus they enable one to isolate the coins of one area from those of another, of one State from those of another and of one period from those of another. . . . The coins of each of these states differ from one another in their execution, fabric, weight, quality of metal and symbology.[6]

The states identified on this basis by Gupta are Surasena, north Panchala (Rohilkhand), south Panchala (lower Doab), Vatsa, Kunala (?Gonda-Bahraich), Kosala, Kasi, Malla, Magadha, Vanga, Kalinga, Andhra, Asmaka, Mulaka (? Hyderabad), Saurashtra and Gandhara.

This opinion may very well be true, but it is not easy to verify or cross-check it. The thousands of punch-marked coins which have been found distributed all over the subcontinent come mostly from 'hoards' and not from verifiable contexts and hence their geographical sorting can never be dependable. However, there is also no reason to waive the opinion of a scholar like Gupta who is well acquainted with punch-marked coins of all areas of the subcontinent. In fact, his analysis offers us a numismatic substantiation of the growth of regional political units from the north-west to the Deccan and the south at the very beginning of early historic India.

Doubts have also been expressed regarding attempts to build up a relative chronology for these coins on the basis of symbols. A distinction is now generally made between the earlier 'local issues' and the later so-called 'Imperial Series' which supposedly came up with the expansion of the Magadhan power. The coins of the Imperial Series weigh between 50 and 52 grains/rattis and are found in many sizes, ranging in breadth from 3 to 1 cm.

> All the coins uniformly have five symbols, punched from five different punches. The symbols on these coins are simple and complex geometrical patterns, ornamental circles or wheels, the sun, human figures, animals like a bull, an elephant, a hare, a deer, a rhinoceros, a fish, a crocodile, a tortoise, bow and arrow, hills and trees in many conventional forms. No less than 300 varieties of symbols may be identified on these coins. They are placed on the coins in a definite system or order, which enables one to distinguish the coins according to their symbol groups and identify them in about 500 varieties. These varieties may be classified in turn into various classes and groups and ultimately into six series. These six series may be placed into a chronology on the basis of the fabric.[7]

This offers a most interesting line of enquiry and speaks more eloquently of the extent of monetary economy in early historic India than anything

else. But one suspects that its typology and fabric-determined chronology would both need further investigation.

As far as the regional divisions of early punch-marked coins are concerned, the silver bent-bar coins of Gandhara (usually two wheel-marked punches at the two long ends of a bar) form a special category and so does the group of coins which are small, globular and bear the imprint of a single punch. The latter category does not seem to be confined to a single region.

Uninscribed cast copper coins bear the symbols found on punch-marked coins but they are not punched; the coin as a whole was made by pouring molten metal in casts bearing the negatives of these designs. Coins of this type are usually rectangular/square and circular, and are found widely distributed. These coins too are supposed to possess both 'universal' and 'local' varieties. According to Nissar Ahmad, these coins could have served the purpose of a copper currency of lesser denominations whereas the silver punch-marked coins stood for a standardized and higher 32 grain/ratti standard.

The archaeological horizon of these two coin-types brooks no controversy. They are found in early NBP level at many excavated sites of northern India, and the general date of their beginning is assumed around *c.* 600 BC. In view of the earlier date of the NBP at Sringaverapura (*c.* 700 BC), an earlier date for the beginning of these coins is not an impossibility and brings us closer to what G.R. Sharma wrote on the basis of his excavations of the Kausambi defences. In his chart of the sequence of 'Kausambi 1957–59', the square uninscribed cast copper coins are shown spread between Structural Periods 5 and 16 whereas silver punch-marked coins occur between Structural Periods 9 and 14. At Kausambi, the uninscribed cast copper coins are thus considerably earlier than the silver punch-marked coins. In Sharma's chronological chart, his Structural Period 5 is marked *c.* 885–*c.* 815 BC. Theoretically, this becomes the date of the associated uninscribed cast copper coin too. In his drawing of the section concerned, an uninscribed cast copper coin is shown in the painted grey ware level of the site. Sharma's date makes it too early for comfort; at the same time, Kausambi painted grey ware is not the classic ware of this type—it appears more like the grey ware that one finds associated with black-and-red ware sites at many places of the central Ganga valley and elsewhere. What is also interesting is that Sharma deduced central Indian chalcolithic pottery elements in the earliest stage of the site. In view of the extensive distribution of black-and-red ware sites in the Sonabhadra region on one of the routes between Gangetic India and central India, Sharma's hypothesis makes sense. Sharma's chronological chart based on arbitrary dating of structural periods does not have to be true; what is important is that in a

borderline phase between the chalcolithic and the NBP at the site he finds a coin. One does not have to be surprised if at this site this level falls in the seventh century BC or if the uninscribed cast copper coins turn out to be somewhat earlier than the punch-marked coins.

As far as the other coins of this early period are concerned, one has to mention the presence of the Achaemenid daric/'sigloi' type in a hoard of the Bhir mound of Taxila, which makes sense in view of the Achaemenid occupation of the area, and the early inscribed copper coins of the Chola, Pandya and Chera kings of the south. K. Rajan mentions that the coins of each dynasty are confined to their territorial divisions. Further he thinks that the square coins are earlier than the round coins of the region.

> The earlier square coins like Peruvaluthi clearly stand as testimony that the Tamil kings started issuing coins as early as the 3rd century BC. Before this we do have local punch-marked coins as suggested by the fish, and bow-and-arrow symbols insignia of the Pandyas and Cheras respectively.[8]

The punch-marked coins continued in use in the south up to *c.* fourth century AD. At north Indian sites, its terminal line seems to be uneven; at Kumrahar in Pataliputra, for instance, this is said to have continued *c.* AD 150.

After the exclusive phase of early coins was over, the numismatic history of early historic India follows a few separate but occasionally interrelated strands. From the late centuries BC onwards, the coin range of the north-western region is dominated, perhaps exclusively, by the coins of the Indo-Greeks, Indo-Scythians and Indo-Parthians (generally in silver and copper and rarely in gold) till the coins issued by the Kushana kings supplant them not merely here but also over a very large tract of Gangetic India. There is a world of difference between the 'Attic-standard' (the standard introduced by Alexander in his empire and accepted by his successors in the east), 'drachms' (*c.* 4 g) and 'tetradrachms' (*c.* 16 to 17 g) of the Bactrian Greek kings up to Euthydemus II and the introduction of 'Indian-standard' coins with bilingual inscriptions (Greek on one face and Prakrit on the obverse) from Agathocles onwards. In fact, according to O. Bopearachchi, the Bactrian Greek king Demetrius I, who first tried his strength in the south of the Hindukush in the wake of the Mauryan decline, introduced a new coin-type with die-struck punch-mark symbols (not punched separately but all engraved in the same die) for his territories south of the Hindukush, which was still used to the punch-marked system. This underlines once again the tremendous significance of the Hindukush as providing a firm geo-political limit of the South Asian land mass. The coins of Agathocles and the later Indo-Greek coins bear the replicas of Indian deities such as Lakshmi and in the Brahmi or Kharoshthi inscription

the Greek name gets Indianized; Agathocles becomes 'Agathuklaya' and 'Pantaleon' 'Pamtaleva'. The Indo-Scythian kings like Maues, Azes I and others and the Indo-Parthians like Gondophares are very much in the Indianized Indo-Greek tradition.

'India' was not ignored in the Kushana coinage; even in the first group of Kushana issues under Kujula Kadphises the 'bull' appears on one type and 'Kharoshthi' as the bilingual counterpart of 'Greek' in all. Kujula's coins were all in copper, but Wima Kadphises, his successor, introduced gold coins of three denominations on the model of the Roman coins which were then being imported into south Asia as part of Indo-Roman trade. However, 'bull' and 'Siva' figure in the Wima coinage which also continued the tradition of bilingual (Greek and Kharoshthi) inscriptions. What is important, however, is that with their extensive possessions in central Asia and with the whole of Afghanistan in their control, the Kushana kings and their coinage were influenced by a motley of elements: Greek, Iranian and Indian. The king after Wima, Kanishka, retains Siva and introduces Buddha as deities on his coins, but a whole host of Iranian (cf. Mithra, Nana) and Greek (cf. Helios) deities also make their appearance on his coins. This tradition continues in the reign of his successors too. On the coins of Huvishka 'Uma' and 'Karttikeya' find a place along with Siva.

In north India as a whole the phase of early coins was succeeded by an extensive range of local coinage belonging either to kings or tribal republics. The punch-mark tradition is now replaced by the die tradition, but the same symbols continue to occur. These coins have been associated with distinct geographical areas and are very important from this point of view. As far as the political history based on kings of different areas (cf. Ayodhya, Panchala) and tribal republics like the Yaudheyas, Arjunayanas, etc. are concerned, these coins constitute the principal source of study. In the next phase, of course, the Kushana coinage takes over, leaving its mark in different forms even in the post-Kushana coinage.

There is a significant tradition of local coinage in the post-Maurya phase in south India and the Deccan. This belongs to royal families such as 'Sadakana' and the succeeding 'Ananda' families in Karnataka, and the 'Kura' family of the Deccan. These are die-struck coins but the punch-marked symbols continue to occur. This particular tradition of local coinage is soon overshadowed by the coinage of the Satavahana kings, issued mostly in lead and copper. Quite unusually, some Satavahana kings of the early centuries AD issued silver coins bearing their own portraitures and names (in Prakrit written in Brahmi script). It is obviously a case of Indo-Greek influence or the influence of Roman coins flowing by now in peninsular India in thousands. The Satavahana king, Gautamiputra

Satakarni, who defeated the Western Kshatrapa king, Nahapana, counterstruck the Nahapana silver coins with his own symbols and name. The successors of the Satavahanas, such as the Ikshakus of Andhra, continue the Satavahana coinage tradition in some way.

The case of the Satavahana contemporaries in western India, the 'Western Kshatrapas' with their two branches of Kshaharatas and Karddamakas, shows some influence of the Indo-Greek/Roman coinage in the sense that a royal bust is placed on one side, but the inscriptions are in Sanskrit and Prakrit.

This outline of the pre-Gupta history of Indian coinage shows a clear geographical configuration. Its main trunk is constituted by the wholly indigenous system of punch-marked, uninscribed cast copper and the local coinage tradition. The north-west was not immune from the influence of the punch-marked series, but, on the whole, that developed a tradition which was based on the character of coins of the Oxus-Indus interaction zone but not by ignoring the main south Asian tradition.

The north-western tradition had a faint echo in the coinage of west India and the Deccan but that was purely ephemeral. The Kushanas, with all their central Asiatic interests, could not forget south Asia altogether.

## SCULPTURE, TERRACOTTA, PAINTING[9]

It is in the Mauryan period that one witnesses the growth of sculptural art after an interregnum of more than a thousand years since the end of the Indus civilization which had a complete command over stone-cutting and sculpting. It is not known how the Indus tradition was passed on or whether the Mauryan period brought about a completely new phase of Indian stone-cutting.This uncertainty once impelled scholars to look for the genesis of Mauryan art in the Achaemenid imperial style and stone-cutting tradition. While some interaction between the Mauryans and the contemporary artists of western Asia is entirely probable and some features of Mauryan art bear its signature, it would be incorrect to state that the Mauryan art was only the product of the ideology behind the Mauryan empire and that it had left no permanent legacy. Second, the Mauryan terracottas too mark a new phase in the history of Indian terracotta art. One need not deny a distinct sense of modelling in some pre-Mauryan terracottas of the Ganga valley, but the evidence is not pervasive. The Indian terracottas assume a distinct time-bound style in the Mauryan period. From both these points of view the Mauryan art marks a new phase in the history of ancient Indian art.

The Asokan pillars are all monolithic and sculpted and are considered,

along with their animal capitals above, parts of the sculptural tradition. The specimens available—the Kolhua, Lauriya Nandangarh, Rampurwa, Sanchi, Sankisa and Sarnath lion capitals and the Rampura bull capital—may be only a small proportion of what originally existed. Parts of Mauryan capitals have been found elsewhere (cf. Masarh, Basi, Salempur, Ayodhya), and broken pillars of the same period occur at a number of other places. Whether there is a steady chronological evolution of the animal capitals from the apparently clumsy Sankisa lions to the growling and confident animals of Sarnath is difficult to say; one would rather think of the differing quality of the artists involved. The Rampurwa bull is firmly modelled but full of natural dynamism in the basic style of the elephant which emerges out of the live rock at Dhauli and the small elephants which occur on the facade of the Lomash Rishi cave in the Barabar hills. The tradition of naturalism is equally manifest in the bull, lion, horse and elephant which are shown along the diameter of the abacus of the Sarnath capital and in the row of geese shown in the sides of the Bodhi throne of Bodh Gaya. The honeysuckles, rosettes, palmettes, lotus-buds, bead-and-reels and volutes as designs on some capitals foreshadow the long history of such motifs in Indian art. However, the design which makes us hold our breath is the design of intersecting circles on the upper surface of the Bodhi throne, which is identical to the intersecting circle design decoration used, very rarely, on the Harappan floors (cf. Balakot, Kalibangan). A sparkling polish of a certain kind on the stone is a signature of the Mauryan period, and from this point of view, the Didarganj yakshini and the Lohanipur torso both fall in the Mauryan period. The Didarganj specimen, which is in the form of a female fly-whisk-bearer, combines dignity with statuesque sensuousness. Whether the free-standing Yaksha figures, including the two Patna yakshas, belong to the Mauryan period is debatable; with V.S. Agrawala we accept a Mauryan date for them. The much smaller mustachioed human head and a few animal heads from the late Mauryan level at Sarnath and the small, partly broken, limestone image of a humpless bull/cow from Harinarayanpur strengthen the assumption that the range of Mauryan art is much wider than the assumed circle of court art. Ringstones of soapstone and metamorphosed schist, which have a central hole or are without them, vary between 10 and 5/6 cm in diameter and reveal a large range of iconographic elements, among which the figure of the earth goddess or *Prithvi*, of a type found in gold at Lauriya Nandangarh, seems to be common. Miscellaneous stone reliefs, including three pairs of frolicking male and female on a panel of three scenes from Rajgir, are reminiscent of the iconographic tradition of this type. The flounced-skirted and heavily coiffured females that one sees

as a dominant type in the Mauryan terracottas are much less attractive than the naturalistic representations of Mauryan terracotta elephants.

It is not quite certain if the dichotomy offered by art historians between the Mauryan art and the succeeding art during the reign of the Sunga dynasty in north India is as valid as it has generally been imagined to be. First, the stone railing around the Asokan pillar at Sarnath follows the basic tradition of railing by uprights, cross-bars and coping stones which was followed by the railings that we find at the 'Sunga sites' of Bharhut, Bodh Gaya and Sanchi. Second, the objects found in the late Mauryan levels of Sarnath suggest that even within the rigorously defined chronological framework of the Maurya dynasty there could be a much wider based art tradition. Third, when one considers the depth of variety of artistic depictions on the stupas of Bharhut, Bodh Gaya and Sanchi, only three of perhaps many more such stupas of the period, one is disturbed by the abruptness of it all. Historically this does not seem to make sense and imparts a distinct sense of dissatisfaction.

The recent discoveries of seemingly contemporary stupa railings and medallions in Orissa and the Kanpur district of UP along with the excavated stupa remains at Pauni in Berar indicate that the distribution of the Sunga period and immediately later stupas is more widespread than its distribution along the Gangetic valley–Deccan route at Bodhgaya, Bharhut and Sanchi would suggest. Bharhut is about 14 km to the south of Satna in Madhya Pradesh. Its surviving remains (railings and gateway pillars) were transported to the Indian Museum, Calcutta, where they are still housed. On the basis of palaeography, they were dated between *c.* 100 and 75 BC. The sculptures were done mainly on the face of the uprights, cross-bars and coping stones of the railings. The first impression is that of luxuriant vegetation—flowers and creepers—in the midst of which the medallions depicting the *Jataka* stories and the uprights showing various semi-divine personages such as yakshas and yakshinis are positioned rather harmoniously. Many of the sculpted scenes and figures contain descriptive labels and/or bear their donors' names who came from various social classes and places, including such distant ones as Kausambi, Vidisa and Pratisthana. The scenes and individual figures are in low relief, reminiscent of panels done in wood. This deficiency in modelling has been more than adequately made up by the way the human limbs have been rendered in stone. For instance, there is a remarkable similarity between the female hand which holds the branch of a tree and the branch itself. The life-force of the tree seems to have permeated the entire composition, including the human figures as a whole and their individual limbs.

Whatever has survived of the stupa (uprights and some railings) at Bodh

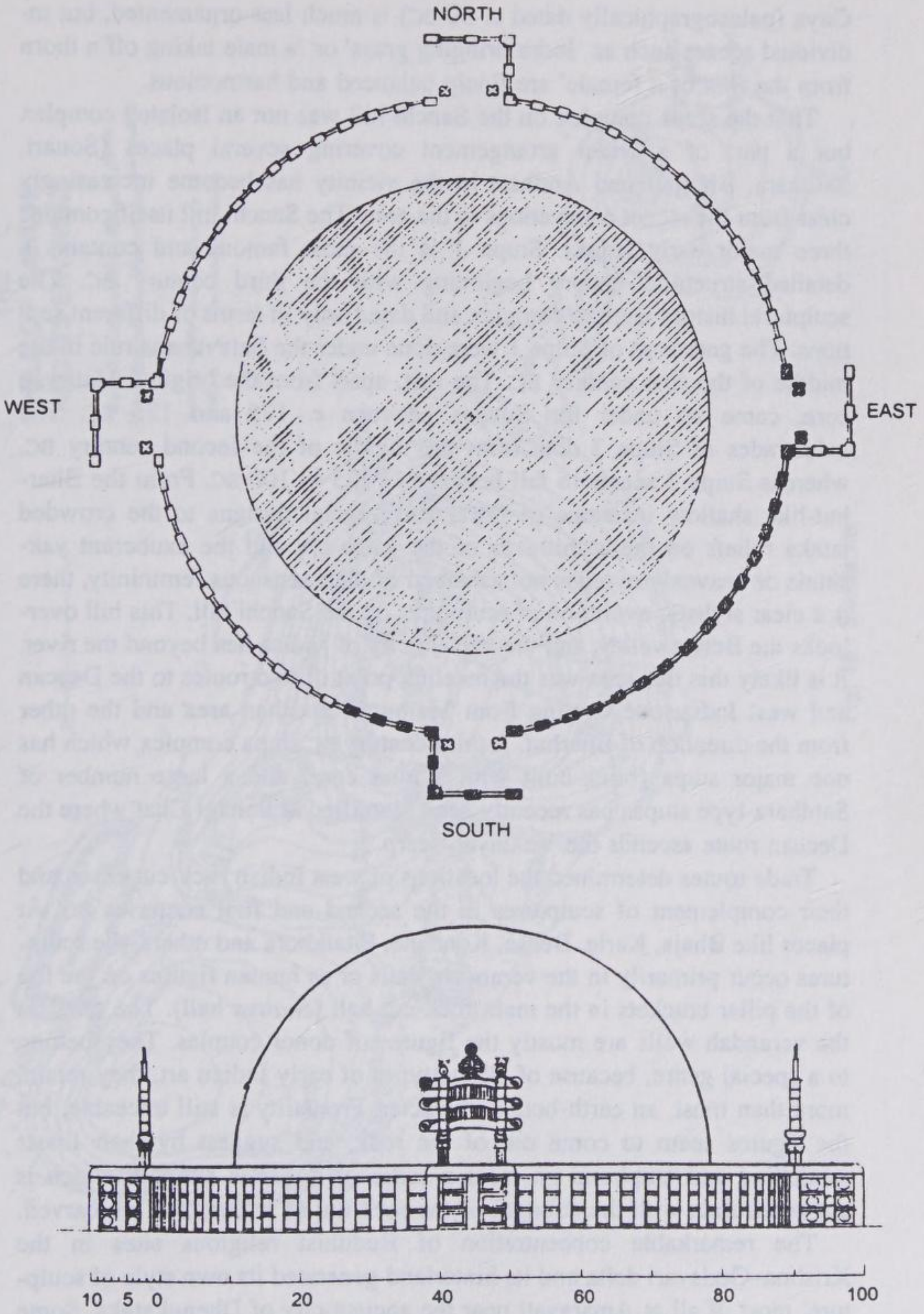



Fig. 45 Bharhut

Gaya (palaeographically dated *c.* 50 BC) is much less ornamented, but individual scenes such as 'Indra bringing grass' or 'a male taking off a thorn from the foot of a female' are finely balanced and harmonious.

That the stupa complex on the Sanchi hill was not an isolated complex but a part of a wider arrangement covering several places (Sonari, Satdhara, Bhojpur and Andher) in the vicinity has become increasingly clear from the recent excavations in the area. The Sanchi hill itself contains three major early stupas. Stupa 1 is the most famous and contains a detailed structural history beginning with the third century BC. The sculptural history is more complex and dated only in terms of different sections. The gateways of Stupa 1 were done under the Satavahana rule in the middle of the first century BC. The rest, apart from the original Mauryan core, came up under the Sungas between *c.* 175 and 125 BC. The balustrades of Stupa 3 date from the middle of the second century BC. whereas Stupa 3 seems to fall between *c.* 125 to 100 BC. From the Bharhut-like shallow incisions of floral and vegetal designs to the crowded jataka reliefs on the architraves of the gateways and the exuberant yakshinis or heavenly nymphs not ashamed of their sensuous femininity, there is a clear stylistic evolution of sculptures on the Sanchi hill. This hill overlooks the Betwa valley, and the ancient city of Vidisa lies beyond the river. It is likely that this area was the meeting point of two routes to the Deccan and west India, one coming from Mathura-Rajasthan area and the other from the direction of Bharhut. A third century BC stupa complex which has one major stupa (brick-built with a mud core) and a large number of Satdhara-type stupas has recently been identified at Sohagi Ghat where the Deccan route ascends the Vindhyan scarp.

Trade routes determined the locations of west Indian rock-cut caves and their complement of sculptures in the second and first centuries BC. At places like Bhaja, Karle, Bedsa, Kondane, Pitalkhora and others, the sculptures occur primarily in the verandah walls or as human figures on the top of the pillar brackets in the main rock-cut hall (*chaitya* hall). The ones on the verandah walls are mostly the figures of donor couples. They belong to a special genre, because of all the types of early Indian art, they retain, more than most, an earth-bound character. Frontality is still traceable, but the figures seem to come out of the rock, and suggest by their linear modelling and emphasis on mass a sense of dynamic strength which is commensurate with the strength of the rock out of which they are carved.

The remarkable concentration of Buddhist religious sites in the Krishna–Godavari delta and its hinterland generated its own style of sculpture, most of all at Amaravati near the ancient city of Dhenukataka. Some carvings here and at Jagayyapeta are in very low relief and somewhat

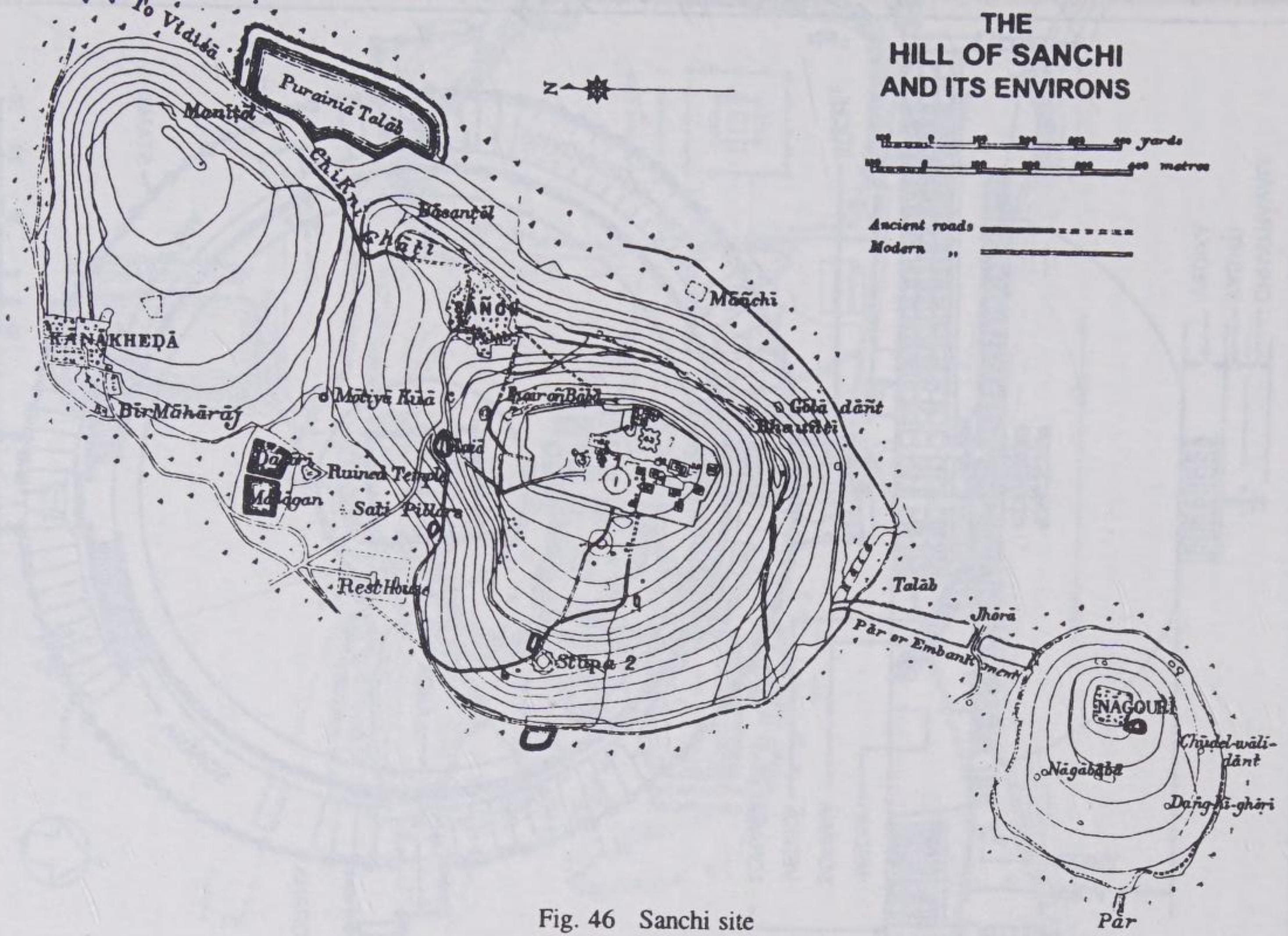



Fig. 46 Sanchi site

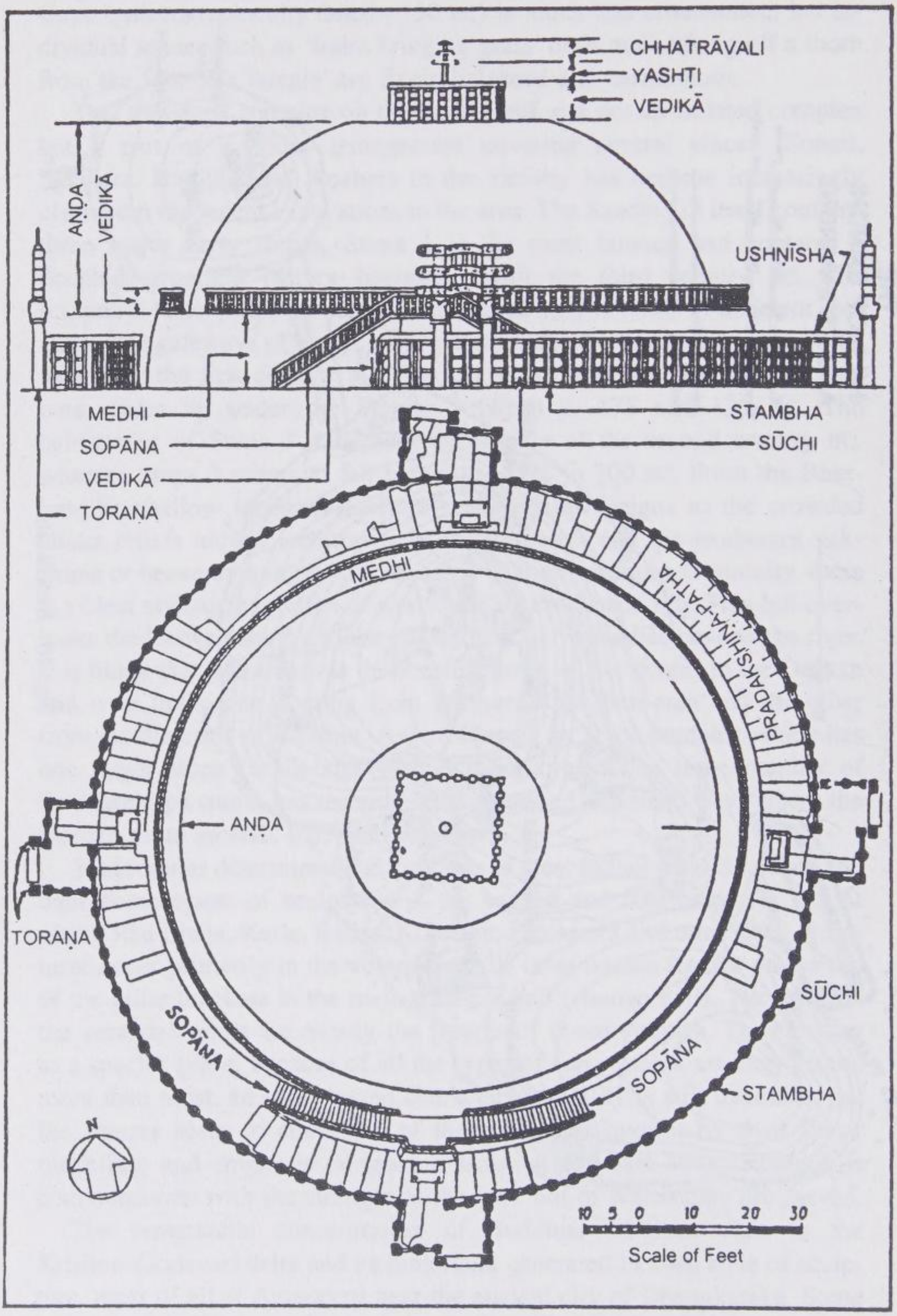



Fig. 47 Stupa plan, Sanchi (Mitra, 1971)

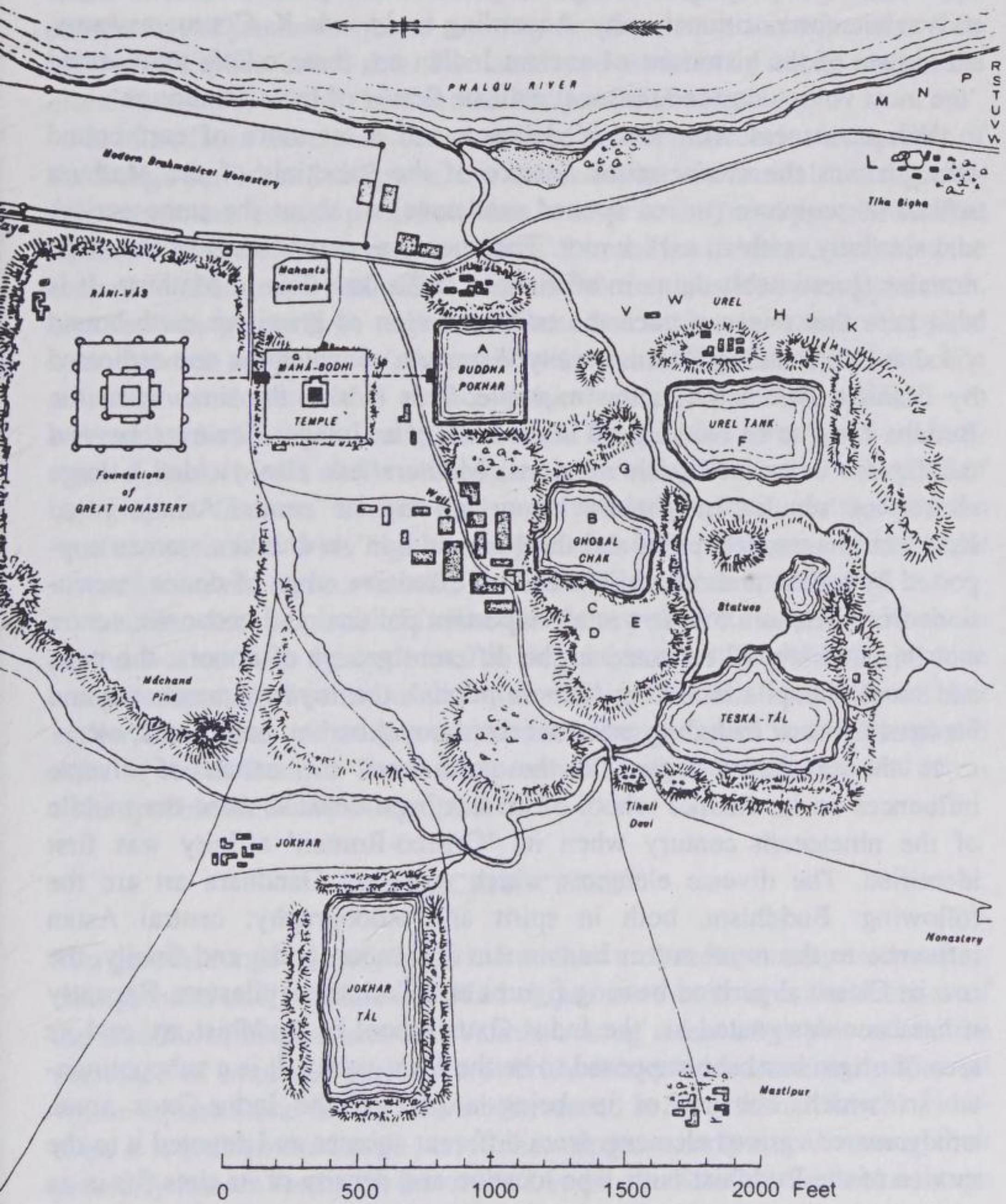



Fig. 48 Bodh Gaya site

archaic style, which continues to develop through the first century BC and first century AD till in the second and third centuries AD the Andhra style of sculpture (in limestone), as it is called, reaches its apogee. Supreme importance is given in this art to human figures which are now elongated and sturdy and shows relief after relief of frenzied sensuous humans with a better sense of perspective, more light and shade and rhythmic lines leading to a dynamic compositional unity. According to Ananda K. Coomaraswamy, the doyen of the historians of ancient Indian art, these reliefs represented 'the most voluptuous and the most delicate flower of Indian sculpture'.

Voluptuousness with less of delicacy and a lot more of earthbound strength was the characteristic feature of the yakshinis of the Mathura school of sculpture (in red spotted sandstone) of about the same period, and similarly, with an earlier root. They occur as components of the stupa remains (presumably Jaina in affiliation) at Kankali Tila in Mathura. It is also here that one can trace the transformation of primitive earth-bound yakshas into standing Bodhisattva type images, of which the one dedicated by Bhikshu Bala is a famous example. This is also the time when the Buddha came to be worshipped in the form of an image. However, beyond the figures associated with religions, Mathura has also yielded a large number of 'secular' images: the heavy and angular 'central Asiatic' royal Kushana images, 'Hercules and the Nemean lion', a drunken woman supported by males, and others. There is an extensive range of donor inscriptions from Mathura too. It was an important political and economic centre and this fact is well reflected in the different groups of donors: the nuns and monks, pupils including 'female pupils', the royalty, merchants and bankers, artisans including metal-workers, royal barber, courtesans, etc.

In the Gandhara region in the north-west, the nature of diverse influences on its distinct school of art has been debated since the middle of the nineteenth century when its 'Graeco-Roman' affinity was first identified. The diverse elements which represent Gandhara art are the following: Buddhism, both in spirit and iconography; central Asian influence in the royal attire; Iranian sun and moon gods; and finally, the row of Classical garland-bearing figures and Corinthian pilasters. Recently it has been designated as 'the Indus-Oxus school of Buddhist art' and its area of origin has been supposed to be the Swat valley. It is a subcontinental art which, because of its being a part of the Indus-Oxus zone, amalgamated various elements from different sources and devoted it to the service of the Buddhist faith. The location and density of its sites fits in as much with the patterns of regional trade routes as do the location and density of Buddhist sites anywhere else in the subcontinent.

As far as the terracottas of the last two centuries BC and the first three

centuries AD are concerned, there is a close similarity in form and style between the time-bound terracottas and sculptures of this period. Such terracottas have not yet been closely studied from the archaeological point of view, but they seem to be more frequent at the Gangetic valley sites, especially in the Bhagirathi delta which enjoys a special significance in terms of sheer number and diversity of themes ranging from Bharhut-type yakshinis and jataka stories to ordinary secular scenes inclusive of a wide variety of explicit erotic acts. The latter type predates by a long margin the erotic sculptures of the Orissan and Khajuraho temples.

Human faces have been found painted on mica-sheets in the context of the Sunga period at Pataliputra, but for examples of classical Indian paintings within our chosen period one has to refer to the paintings of Buddhist theme, which have survived in Caves 9 and 10 of Ajanta, dated in the second to first century BC. Here and elsewhere a paste of powdered rock, clay, cowdung, chaff or vegetable fibres and molasses was first applied over the rock surface and (when still wet) given a coat of white lime. The painting was done on this surface—*Vajralepa* of the Indian tradition—in red and yellow ochre, indigo and lapis lazuli blue (not used in early Ajanta), lamp black, chalk white, *terre verte* and green colours. Instead of calligraphic fineness we get bold and rounded elasticity formed by the 'surface saturated with highly charged and dense colours, mainly *terre verte*, Indian red and earth buff, in innumerable tones and shades'.

Another distinct genre of Indian art of the period is ivory. The Kushana period ivories from the trade city of Begram in south Afghanistan provide a rapturous mix of sensuousness and elegance in their female forms, but earlier specimens of ivory work are now being found in the Bhagirathi delta of lower Bengal. These compare well with the sculptural and terracotta specimens of the Sunga period.

## ARCHITECTURE[10]

The general range of early historic Buddhist architecture comprised stupas, chaitya halls and monasteries. Mud stupas were built over the remains of the Buddha at Kapilavastu and Vaisali, among a few other places, and the existence of Mauryan period burnt-brick domes with stone umbrellas set within square stone railings have been traced at Sarnath and Sanchi. However, it is only in the Sunga period that the great early stupas assume their presently known forms. In the case of Stupa 1 at Sanchi, the Asokan stupa was then enlarged and encased in a veneer of well-dressed stones, with a high circular drum around it. The top of this drum was approached by two stairways with balustrades on the south and formed the upper circum-

ambulation path. Another circumambulation path at the ground level was demarcated by a railing with L-like projections at the four cardinal points, leading to the ground balustrade being divided into four quadrants. Under the Satavahana kings the four gateways were added. In each of these gateways pillars with capitals support three curviform architraves with

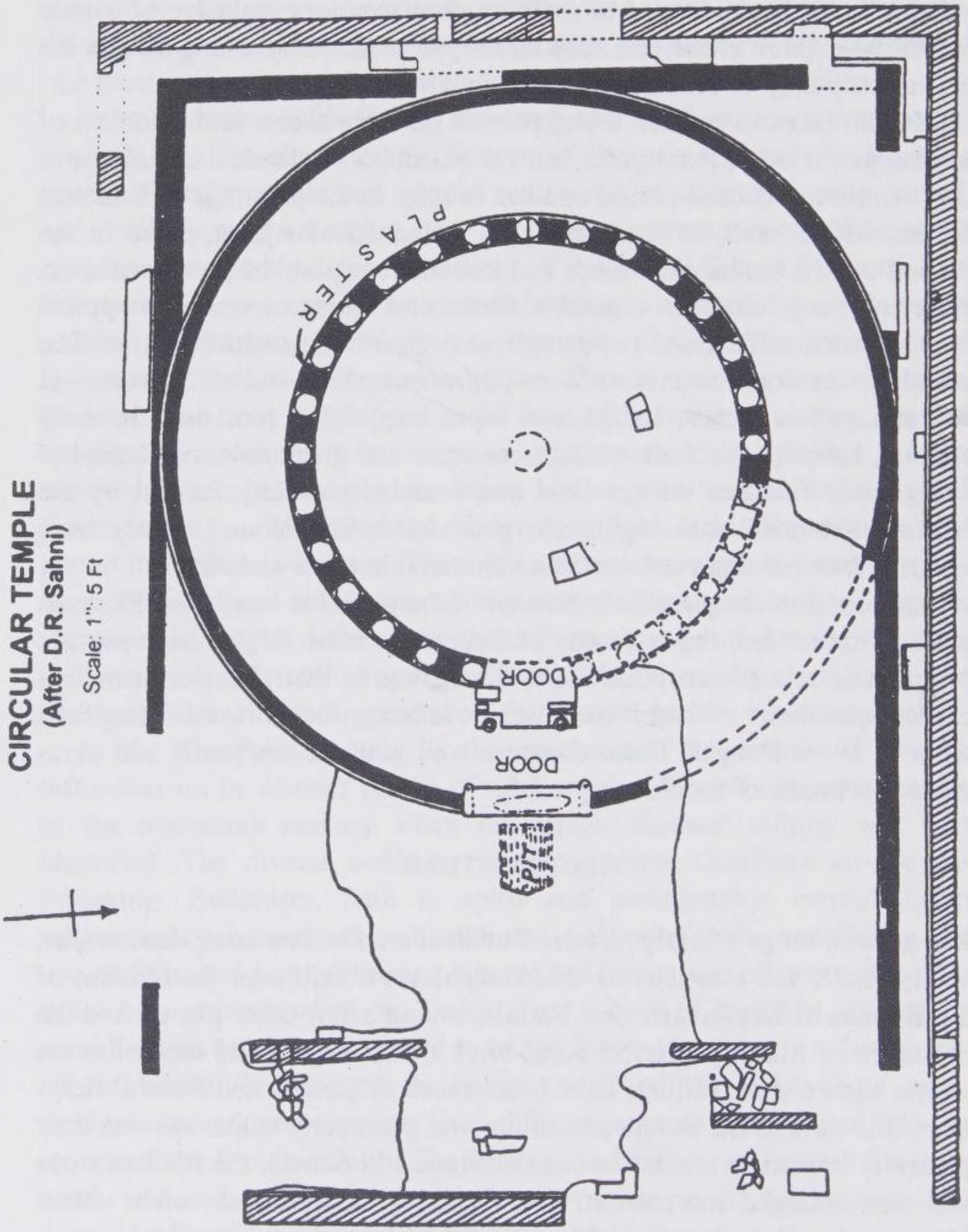



Fig. 49 Bairat circular 'chait

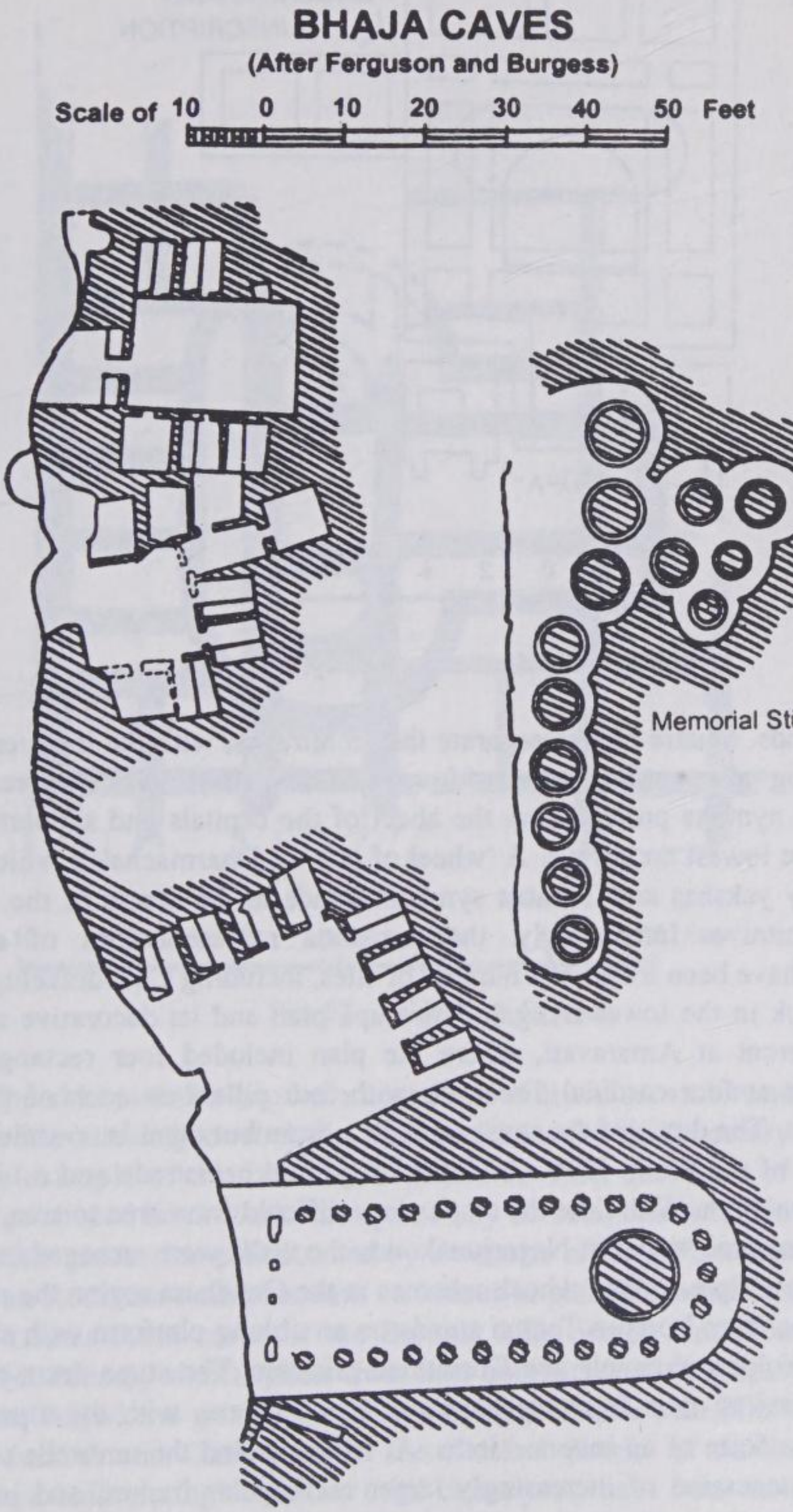



Fig. 50 Bhaja caves

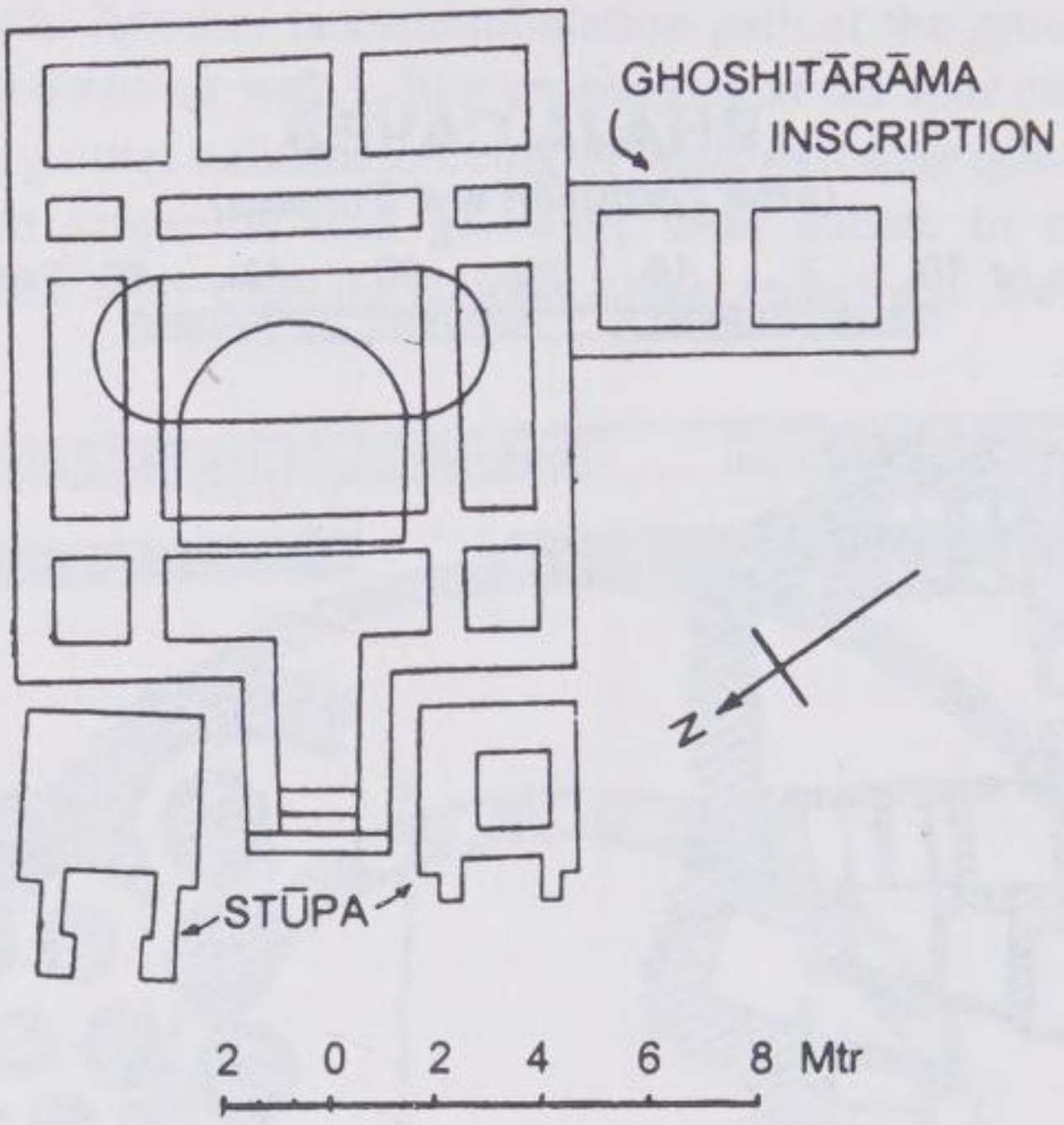



Fig. 51 Ghositarama monastery, Kausambi

voluted ends. Square blocks separate the architraves, with the intervening space being taken up by figures of horse and elephant riders. The bracket figures of nymphs project from the abaci of the capitals and support the ends of the lowest architrave. A 'wheel of law' or Dharmachakra which is flanked by yakshas and Triratna symbols stands in the centre of the top-most architrave. Interestingly, the terracotta representations of such gateways have been found at a number of sites, including Chandraketugarh and Tamluk in the lower Bengal. The stupa plan and its decorative style were different at Amaravati, where the plan included four rectangular projections at four cardinal directions with four pillars on each of these projections. The dome of the stupa rests on a drum but there is no stairway to the top of the drum. However, it had a ground balustrade and a lower processional path. With time the stupa plans differed from area to area. For instance, in some stupas at Nagarjunakonda the walls were arranged in the form of a multiple-spoked wheel, whereas in the Gandhara region the miniature stupa from Loriyan Tongai stands on an oblong platform with sides showing sculptured panels and Corinthian pilasters. The stupa drum rises in four receding tiers from the centre of the platform, with the topmost drum in the form of an inverted lotus. At its lower end the umbrella shaft shows a succession of increasingly larger rectangular frames, and in its upper section there are six tiers of umbrellas of progressively larger sizes.

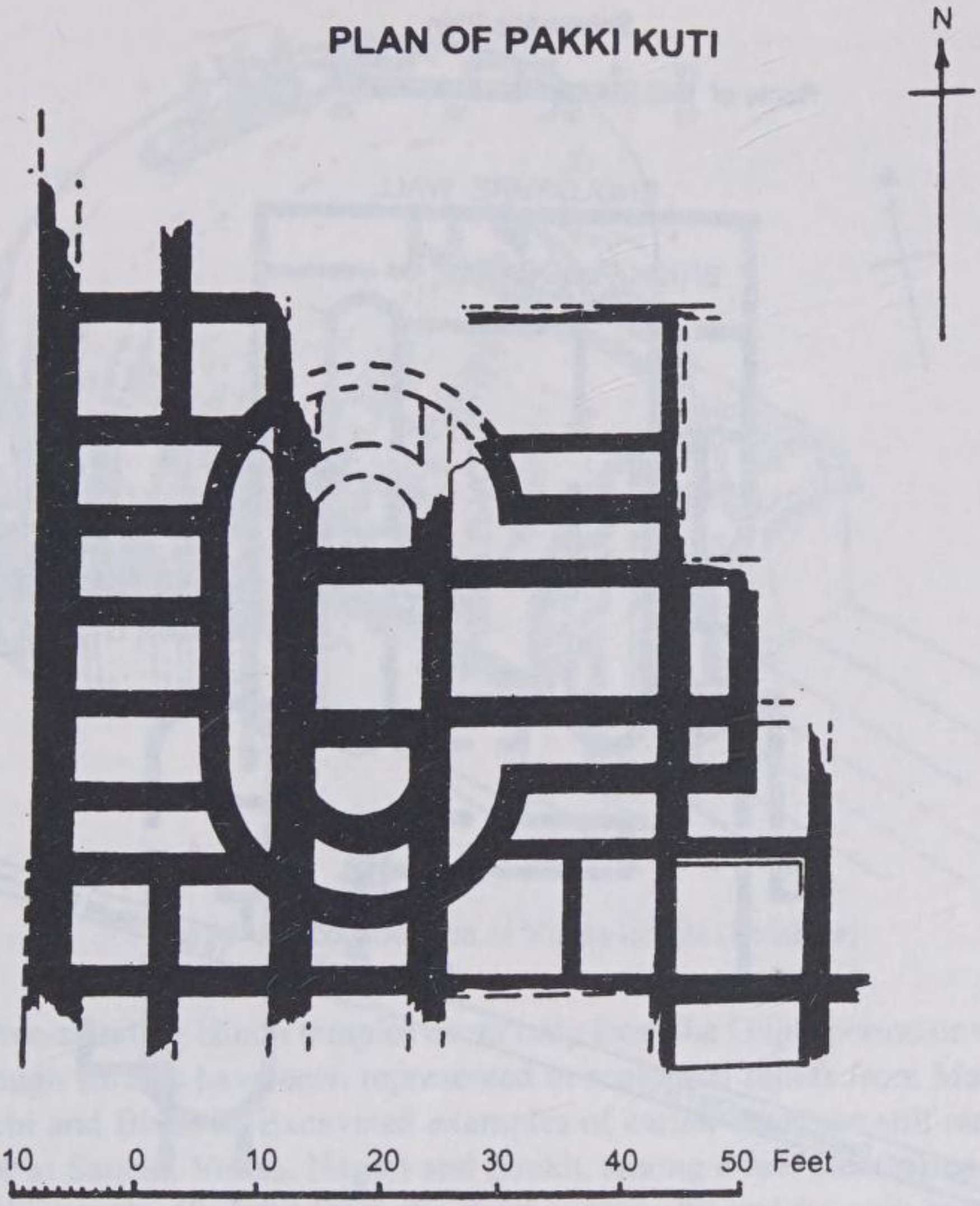



Fig. 52 Pakki Kuti, Sravasti

The chaitya-halls, another major form of Buddhist architecture, may be both free-standing or rock-cut and date from the third century BC. A circular example of this period, which had an inner enclosure of a panel of wedge-shaped brick-work interspersed by 27 octagonal wooden pillars and an outer procession path formed by a circular brick wall, was excavated at Bairat. Rock-cut examples with variations in planning occur in the Sudama and Lomas Rishi caves of the Barabar hills, which date from the same period. Broadly similar plans from later contexts (*c.* first century BC) occur in the Tulja-Lena group of rock-cut caves at Junnar near Nasik, Kondivte in Mumbai and Guntupalle in the Krishna district of Andhra. Apsidal chaitya halls dating from the third century BC have been noticed in the Sanchi temple 40 and at Sarnath and Rajgir (below Maniyar Math). Their

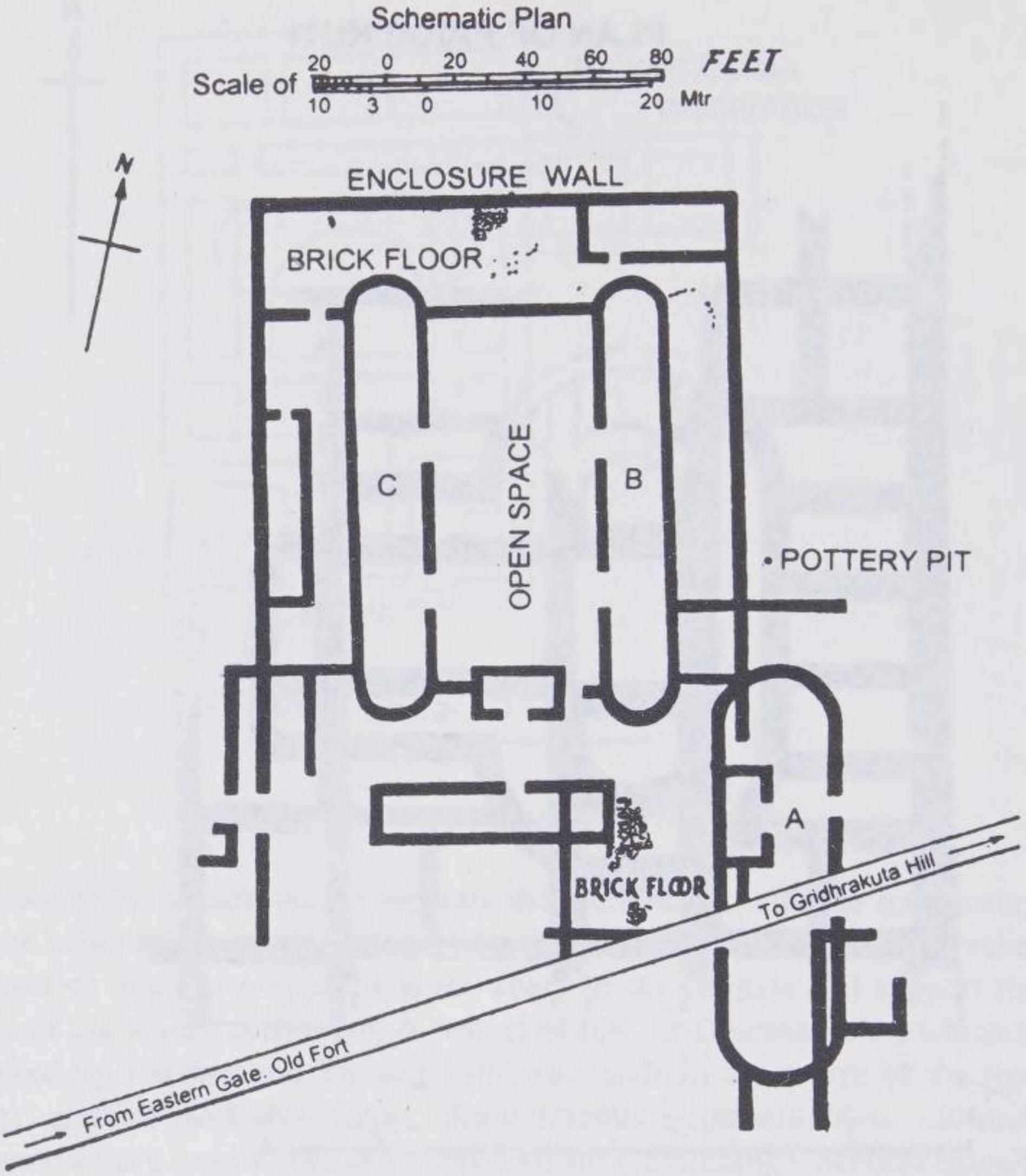



Fig. 53 Jivakamravana of Rajgir

rock-cut forms (*c.* second century BC to *c.* second century AD) are easily seen at Bhaja, Bedsa, Karle, Ajanta (caves 9, 10) and Pitalkhora (caves 3, 10, 12, 13). It is a long apsidal hall, divided into a nave for congregration, an apse containing the stupa and aisles demarcated by colonnades around the nave and the apse. The ceiling of the apse and the nave is barrel-vaulted, containing wooden rafters in some early cases (cf. Bhaja). Structural examples of apsidal halls were also known (cf. Sirkap). Quadrilateral chaitya halls belong to a later period. Monasteries go back to the time of the Buddha. Examples of a complex of elliptical and rectangular halls have been traced at *Ghositarama* of Kausambi, *Jetavana* of Sravasti and *Jivakamravana* of Rajgir. Rock-cut examples of a later period can be seen at many places (cf. Bhaja, Bedsa, etc.)

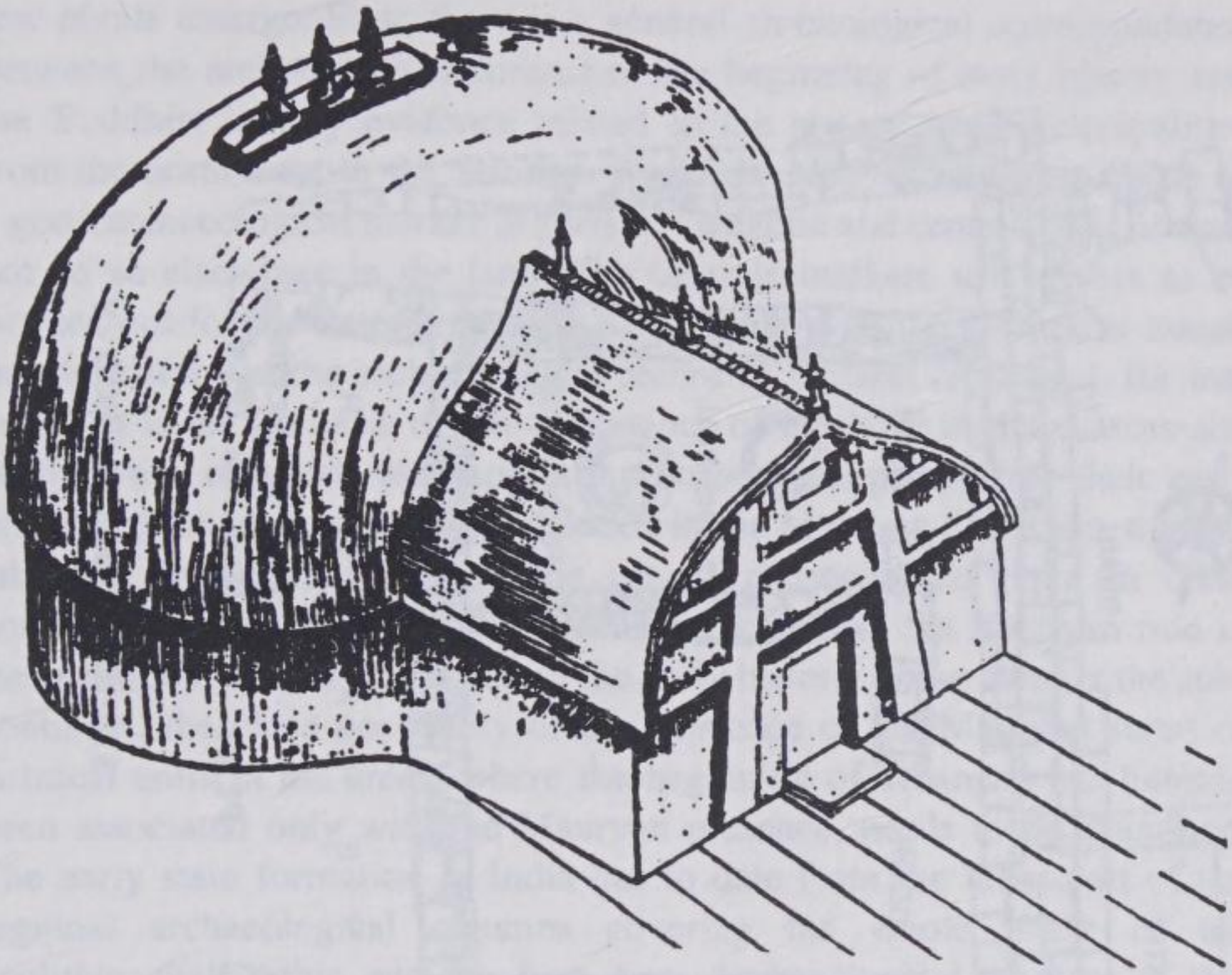


Fig. 54 Reconstruction of Vidisa temple (Lalitkala)

Free-standing Hindu temples occur only from the Gupta period onwards, although shrines have been represented in sculptural reliefs from Mathura, Sanchi and Bharhut. Excavated examples of earlier dates are still rare and occur at Sanchi, Vidisa, Nagari and Sonkh, among a few other places. The Sanchi temple 40 dates from the third century BC and its only surviving portion is its apsidal stone plinth with steps on the east and the west. At Vidisa, the foundation of an elliptical structure was found within the outline of the foundation of another elliptical structure with a rectangular projection. This original outline of the famous Vasudeva temple of Vidisa dates from the third century BC. At Nagari or ancient Madhyamika in Rajasthan (near Chitor) there was a similar construction of timber and mud walls of the same period. The Sonkh specimen—an apsidal Naga temple—belongs to the second century AD Recently, an apsidal structure on rammed burnt-brick foundation has been dated to the late Mauryan period at Sarnath.

## Concluding Observations

In the preceding sections we have tried to isolate the essential character of the major components of early historic archaeology of the subcontinent. A

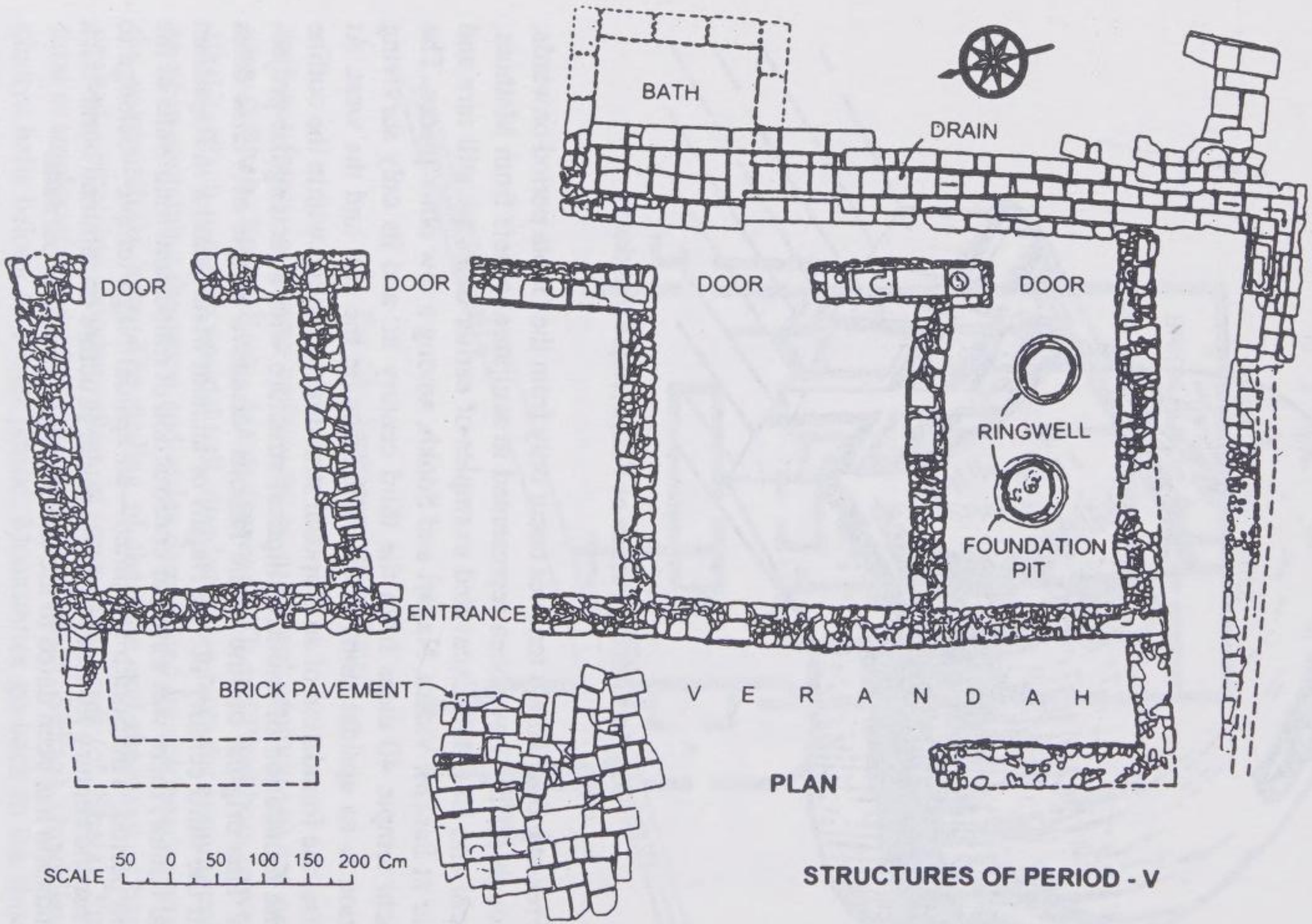



Fig. 55 An ordinary early historic house at Adam (*Indian Arch.—A Rev.*)

few points emerge. First, there is a general chronological correspondence between the archaeological context of the beginning of early history and the Buddhist literary evidence related to the sixteen great principalities from the north-west to the Deccan. While the NBP serves the purpose of a good archaeological marker in parts of Gangetic and central India, it does not do so elsewhere in the land. The ceramic markers still remain to be worked out for the latter areas. For instance, how do we define the transition to history in the archaeological record of Gujarat or Bengal, for instance? It is on the basis of the appearance of the NBP in these areas and on the basis of a tacit assumption that these areas passed into their early historic phase only after being included in the Mauryan dominion, that we take the third century BC as the cut-off chronological point in these contexts. Without trying to deny the significance of the Mauryan rule in the consolidation and expansion of the early historic phase all over the subcontinent, the close possibility of the existence of pre-Mauryan states or political units in the areas, where the beginning of urbanism has hitherto been associated only with the Mauryan presence, needs to be examined. The early state formation in India has to date from the latter part of the regional archaeological columns covering the whole phase of the neolithic–chalcolithic and the Iron Age. Archaeological markers of this formation have to be worked out first regionally. Even in the relevant section of Gangetic India, the NBP need not be mechanically construed as the cut-off point between protohistory and early history. There should be an important shadowy phase in between.

Second, the fact that the NBP cannot be mechanically construed as an archaeological marker of early historic urbanism all over the subcontinent has been driven home by the probability of an urban growth going back to the sixth to fifth century BC in the Kaveri delta and its hinterland. Earlier we have drawn attention to the archaeological finds from this region on the basis of Rajan's work. The local inscriptional corroboration of the south Indian states mentioned by Asoka is a major breakthrough in the study of south Indian history and points to the growth of states in this region in the pre-Asokan period. On the basis of inscribed Tamil–Brahmi sherds, the like of which has been dated at Anuradhapura in Sri Lanka around the middle of the first millennium BC, its beginning can easily be taken back to *c.* 500 BC. This, together with the mounting evidence of a separate early tradition of Chola, Pandya and Chera coinage, the consolidation of arterial routes and trade marts of the region (cf. Karur), and the large size of some of the settlements, will make the study of the archaeology of this part of the subcontinent an exciting prospect.

Third, what may be considered somewhat dist··bing is the uneven char-

acter of data on settlement contexts of different regions. Till the overall settlement picture is clear, it is difficult to isolate the various categories of settlements of a given region and relate them as far as practicable to the basic textual, inscriptional and numismatic evidence from that region.

Fourth, as far as this latter category of evidence is concerned, there is a fair amount of correspondence with what can be inferred from archaeology: the general outlines of urban planning, as mentioned in texts; the evidence of intense craft-specialization, as suggested both by texts and inscriptions; the significance of both internal and external trade and trade routes, as reflected in literature, inscriptions and the distribution of coins and various raw materials and finished products; and so on. As long as one does not expect to find the literary minutiae reflected in detail in the archaeological record, there is no problem regarding the level of correspondence between archaeology and the relevant literary, inscriptional and numismatic evidence of early historic India.

Fifth, despite the probability of distinct regional features in the archaeological assemblages of various parts of the subcontinent, which have not yet been looked into in detail, the initial impression of early historic India is that of a great uniformity in material traits down to the level of pottery. The early historic pottery that one may find in the cliff-sides of Himachal Pradesh in one season may turn out to be overwhelmingly similar to the pottery that may be dug out of a river cliff in West Bengal in the next. This impression deepens when one considers the quick spread and historical evolution of a pervasive art idiom from the Maurya–Sunga phase onwards. The Gandharan art may be an exception, but even here the basic themes and iconography are subcontinental. Further, when one thinks that the time-bound terracottas and sculptures are bound within the framework of the same idiom, one feels more convinced by the logic of this argument. As far as coins are concerned, we have drawn attention to the basic indigenousness of the Indian coinage as reflected in the segment of punch-marked–cast copper–local coins lineage. The style and content of the inscriptions do not greatly vary either. Whichever way we view it, it is the streak of broad uniformity running through the different archaeological components of early historic India which commands our attention than the many undoubted elements of regional variations.

Finally, we must appreciate the simple fact that early historic India is deeply rooted in the archaeological columns that we have traced in the preceding chapters.

# VIII

# Some General Issues

## Geography

This volume began with an examination of the various introductory issues related to the study of archaeology of the subcontinent. Geography, as we argued, is a major theme in this context. It is not the complexity of palaeogeography that we are concerned with here. It is rather the question of trying to understand the pattern of archaeological development in terms of various geographical configurations and their long-term geo-political implications. A few major points stand out. First, the subcontinent's north-western 'frontier' fans out beyond the arid stretches and uplands of the present political boundary and reaches the Oxus and the eastern rim of Iran. This is the subcontinent's most important 'frontier'; elsewhere it is only a matter of having cultural and economic links between the two slopes of a mountain without any major ramification beyond the slopes. Historically India and south-east Asia have interacted significantly not through the Arakan Yoma or the Patkoi range but across the Bay of Bengal. The nature of interaction between Tibet and Nepal and the north-eastern Indian region was primarily religious. Even when Tibet did play a role in the politics of Nepal and eastern India, as it did under Srong-tsan-Gampo in the second half of the seventh century AD, it was short-lived, and so was the Tibet-based incursion of the Chinese in 1962. However, the significance of the Indus-Oxus zone as the subcontinent's cultural, economic and historical frontier should not be exaggerated in detail. It is not easy to define its boundary on the Indus side; its primary significance possibly lay on its western bank, and the whole area between the southern slopes of the Hindukush and the western bank of the Indus was possibly one of its core segments. As far as Iran is concerned, Iranian Seistan and Baluchistan and modern Pakistani Baluchistan no doubt formed a distinct orbit in the historical and pre-historic times, but again, the thrust of this orbit on the sub-

continental side possibly petered out mostly in Baluchistan itself. Among other things, one remembers the distribution of cairn burial sites in Baluchistan, which had links with the Fars plain of the early historic period, but this distribution was confined exclusively to Baluchistan and did not touch the Indus valley in any way. Similarly, it is unlikely that the 'bevelled-rim bowls' which are hawked as a sign of Mesopotamian 'Uruk' expansion and whose presence at Miri Qalat seems to have generated some interest as a marker of Mesopotamia's 'civilizing mission' in the east towards the Indus valley, would be found beyond Baluchistan in the Indus valley itself. It is only when there was a conscious and well-motivated thrust from a strong political power base in Fars or Khorasan or the Oxus valley that the Indus area came to constitute an active part of the Indus-Oxus interaction zone. Moreover, several sub-areas may possibly be outlined within this interaction belt, each with its own linkages and particular historical, economic and cultural impacts. For instance, Badakhshan, Chitral and the neighbouring heights possibly formed a smaller interaction zone within the broad sphere of Indus-Oxus interaction.

Second, while thinking in terms of 'frontiers', can one put them entirely beyond the maritime connections? One is not sure, because, as far as the Indus-Oxus frontier zone is concerned, the Sind–Gujarat coast's links with the Gulf zone expanded its dimension. When both central Asian and Indus civilization traits turn up in the late third millennium BC context at Tell Abraq in Oman, one has to think of the whole network of links covering both the overland and maritime linkages of the subcontinent's north-western frontier. It is these linkages which make us understand why there has always been a sizeable subcontinental presence in the Gulf or why the *banias* from the north-west have operated as far as Baku and St. Petersburg.

Third, while dealing with the developments in the subcontinent beyond the Indus-Oxus interaction zone, do we put emphasis only on the major agricultural units, the nuclei of most of the modern states, as we have done in the course of our text? Or, do we try to put our data in some other geographical framework? The modern state divisions contain within them some major but not necessarily homogeneous geographical realities, and a state-wise arrangement of data is certainly convenient both for presentation and modern understanding. However, the geographical characters of both regional and local linkages have to be understood both in terms of their geography and changing historical dimensions. For instance, the Gangetic delta—now divided between Bangladesh and India—is a meaningful geographical entity, but within it are a large number of interacting areas with their own linkages and historical dimensions. The Karatoya valley of

modern Bangladesh has had historical links with the Brahmaputra valley in Assam, and similarly, the area of the old course of the Brahmaputra in Bangladesh has had links with Assam too. To understand the possible geographical implications of the locations of Mahasthangarh and Wari Bateshwar in Bangladesh, these geographical linkages have to be kept in mind. Such linkages were, of course, not always on the same scale. The scale was determined by historical forces, but it is useful to remember the possible range of geographical pulses. The flow of the subcontinental history and archaeology in terms of such linkages still remains to be worked out in depth and through time, but as far as we can see, this is a much more exciting approach than attempts to divide the subcontinent in terms of the arbitrary, static and ahistorical categories of perennial attraction, relative isolation and isolation.

## PREHISTORY

Prehistoric research in the subcontinent suffers from a very serious contrast between the abundance of prehistoric artefacts on the one hand and the lack of chronological, cultural and environmental information on the other. However, a number of important developments have taken place in recent years. The first is certainly the two-million-year-old dating of artefacts from Riwat, which is indirectly supported by Indian geologists' earlier claim of lower Pleistocene dates for lower paleolithic tools in the Siwaliks and Ladakh. This early dating has opened up interesting fields of study, one of which is the stagewise reconstruction of the lower palaeolithic development in the subcontinent, especially the gap between the beginning and the emergence of the Acheulian industries in various areas, some of which, as we now know, can date from 0.5 million years ago or earlier (cf. Dina and Jalalpur). In a sense this problem affects the middle and upper palaeolithic studies too. The middle palaeolithic in western Rajasthan is as early as 144000/150000 years BP, whereas in the Hiran valley of Saurashtra it is only 56,800 years BP. The upper palaeolithic in the northwest dates from 45,000 years BP and later, but in other areas it can be several thousand years later. This is nothing unusual, but the chronological differential between different types of sites in different areas has to be understood in order to obtain a better idea of how the palaeolithic stages developed in the subcontinent. In one way, a better chronological frame should also help to assess the place of the subcontinent in the scheme of human evolution. Even if one decides to ignore the issue of the presence or absence of *Homo erectus* in south Asia, one has to face the problem of

the emergence of modern humans. This issue has gained some urgency in the context of the identification of *Archaic Homo sapiens* at Hathnora.

The second major development in the field of Indian palaeolithic studies is the beginning of palaeoclimatic research. In spite of what has been achieved, especially in Kashmir, Rajasthan, Gujarat and the upper Son valley, research in many of these areas is qualitatively uneven. Multi-faceted lines of investigation were pursued only in Kashmir, and even there the climatic sequence could not be related to the archaeological succession earlier than the upper palaeolithic. What has been obtained in other areas is perhaps no more than a range of possibilities. The way in which the pollen sequence of the salt lakes of western Rajasthan has been taken as a catch-all of the climatic inferences over a large area does not seem to be particularly edifying.

The third major development in this context is the general adoption of a settlement-subsistence approach. The distribution and character of lithic sites in the context of the various food-collecting activities pursued by modern villagers and tribals of the area, gives an insight into the possible ways of food collection from the same landscape by prehistoric hunter-gatherers. We have noticed that this approach has been successfully applied in some areas. Two points may be noted in connection with this type of research. First, it might be more useful to have a picture of year-long food-collecting activities by the relevant modern groups, so that the details of the whole range of this behaviour are available. Second, it is possible that the distribution of lithic scatters that is being considered in a study area may cover not merely an extremely long chronological spectrum but also fall outside one's focus of a particular 'age'. For instance, there is no assurance that the microlithic scatters that may be found in a survey area belong to a 'mesolithic age'. For all one knows, these scatters may cover the whole chronological span from the mesolithic to the Iron Age and even later. The settlement-subsistence approach can give an idea of only a general range of possible food-collecting behaviour in the landscape. It cannot bypass the issues of geo-archaeology and chronology.

The fourth major development in the field, in fact, touches the geo-archaeological and chronological issues. Whereas absolute chronology depends on finding suitable samples for dating, geo-archaeological studies in India have to a large extent suffered because of lack of trained personnel and inadequate laboratory facilities.

The fifth such development has been in the area of typological-technological studies. On the whole there is a greater emphasis on the study of stone tools in the context of a wide range of attributes and their quantitative analysis. This should lead to a better comparison between industries

of different areas. Another type of useful study in the same context is that of inter-site variability of artefacts. The experimental lithic studies have not made any headway in India, not least in the context of prehistory.

The lack of prehistoric settlement sites continues to be a serious problem in the study of Indian prehistory. It is possible that people did not spend nights in the areas of tool manufacture; they could have put up elsewhere strictly temporary and open-air shelters, the remains of which would have been washed away in the next monsoon. Still, the extensive occurrences of artefacts should be subjected to traditional excavation. As things stand, very few of such occurrences have been excavated. This is more true of the very large spreads of upper palaeolithic tools in various areas. The increased richness of upper palaeolithic assemblages, which is significant from the point of view of later prehistory, has not yet been adequately investigated in the subcontinent.

Although the mesolithic situation is better understood, the early mesolithic evidence is still scanty, considering the size of the subcontinent and the richness of its microlithic scatters. In any case, the relationship between the early mesolithic and the mesolithic of the type at Bagor (the first phase) and Adamgarh still remains to be worked out. Among other things, the possible contribution of the mesolithic tradition to the beginning of settlements in some river valleys, including the Ganga valley, continues to remain obscure. One would like to know, for instance, what happened to the tradition established by such sites as Sarai Nahar Rai and Mahadaha in that particular area of the Ganga valley. In the case of the microlithic scatters it is easier to comment on the transport of raw materials or on their localization according to the local natural features. For instance, a recent survey of microlithic sites in the Tarafeni valley of West Bengal has noted a 'high density of sites' in an area where 'outcrops of black chert, cherty quartz, varieties of coloured chert, quartzite, chalcedony, grey chert and meta basalt that have been used in various quantities are absent.' Further, after the stage of initial trimming, cores were carried around and worked at various places.[1] As long as the contemporaneity of such microlithic clusters in a given area (in this particular area the present author found some microlithic clusters with one or two neoliths) is not emphasized, this kind of analysis opens up a possible range of behaviour among the hunting-gathering communities of this stage. The microlith-using communities certainly moved around and could have played a role in defining the regional lines of movement. This idea occurred to the present author after observing the distribution of microlith-using painted rock-shelters in the eastern Vindhyas. This distribution is neatly aligned to the route going out of the Banaras–Mirzapur area towards central India and the Deccan.

## SETTLEMENT

The issues of Indian protohistory and early history have a different dimension, and here we may briefly allude to the themes of settlements, agriculture, metallurgy and trade, mainly dwelling on their diversities and continuities. As units of study, settlements provide perhaps greater insight into the long-term geographical and historical forces than anything else. A reasonable idea of ancient land use may be obtained simply by taking note of their exact location and the types of land which were available to them for exploitation by means of pre-industrial agricultural technology. For instance, many black-and-red ware sites of West Bengal are found to be located near marshy depressions which are likely to retain water or moisture for a greater part of the year. Rice was the main crop and one is perhaps justified in inferring that rice cultivated in West Bengal during this period included a variety which resembled the modern *boro* rice (sown in seed-beds and transplanted in December/January on the soft clayey soil of the river banks or margins of marshy lands). In the case of a black-and-red ware site in Bihar, which is not far from the bank of the Ganga near Kahalgaon, it is likely that the cultivators of the period took advantage of the *char* lands (river islands) both for winter pulses and vegetables and grazing cattle. It is an important feature of the economic activity of the area now, and because the modern village and the black-and-red ware settlement are located at the same spot, there is no reason why the ancient economic behaviour had to be different. Another possible significance of ancient settlement studies in the subcontinent is that it is likely to lead to a more precise definition of ancient territorial units mentioned in literature. For the north Bihar plains we have four geographical names in ancient literature and other evidence: *Videha, Mithila, Vajji,* and *Tirabhukti.* The geographical meaning of these terms has been discussed by many scholars. Our study of the distribution of sites in this region suggests that 'the archaeological core of north Bihar seems to lie in its central north-south segment, roughly between the Sitamarhi–Vaisali–Ganga/Gandak line on the west and the Saharsa–Khagaria line on the east', and that the geographical identities suggested by these terms were broadly the same.[2] *Anga* and *Magadha* are two neighbouring and ancient political units, and although their broad geographical definitions have long been understood (Anga: the modern Bhagalpur area; Magadha: south Bihar), the demarcation line between them is less defined. The distribution of sites in the region underscores the significance of the Kiul river in this connection.[3] Perhaps the most significant need in this area of study is to establish a detailed picture of settlement diversity area by area. Modern settlements vary widely in their functions and characters. There is no reason why the

ancient picture should be different. But somehow, not enough attention has been paid to this issue. On a preliminary level, it should easily be possible to differentiate agricultural and/or trading settlements from those which came up mainly as resource–procurement centres. Most of the major settlements were, of course, likely to have combined different functions. Mohenjodaro was no doubt a major political, craft and trade centre of the period; at the same time we have suggested that its role could also have been a bit like that of Shikarpur in the early nineteenth century. Shikarpur, located at the mouth of the Kachchi plain on the Indus side and thus on a line of communication between the Kachchi plain and the Indus river, received the trade coming through the Bolan pass and played an important role in the economic life of Afghanistan and central Asia. Mohenjodaro is on the bank of the Indus and easily connected with the Shikarpur area; it could have played a similar role in its own time. In a different context, Sohgaura located at the confluence of the Ami and Rapti in the Gorakhpur region is known to have been a Mauryan administrative centre. Its location suggests that it lies in the midst of a singularly rich agricultural area, and perhaps it was this factor which led to its selection as a lesser centre of Mauryan administration. Ancient Rajgir is located in an area from which the Hazaribagh sector of the Chhotanagpur plateau is easily accessed through the Nawadah plateau. It is also known that Rajgir was the Gangetic valley terminal point of the Rajgir–Paithan route, one of the early recorded historic trade routes from the Gangetic valley (Rajgir) to the Deccan (Paithan). In view of the geographical location of Rajgir showing an easy access to the Chhotanagpur plateau, it is probable that the raw material resources of this plateau were part of the early historic Gangetic valley–Deccan trade through Rajgir. In fact, at the edge of the plateau to the south of Rajgir, there are two major early sites: Devangarh (a walled early historic city—unexcavated) and Fatehgarh, which is supposed to have a sequence from the neolithic/black-and-red ware stage upwards. It is through simple geographical studies of this kind that the settlement maps of different stages of protohistoric and early historic India can acquire an element of historical realism.

Another issue which still remains partly neglected is that of settlement continuity at the same spot or in the same village area from the protohistoric period onwards. With some exceptions, this is the general picture in West Bengal and a large part of the Ganga plain. However, the regional pictures have to be studied closely in order to identify the main turning points of settlement history in different parts of the subcontinent. The very fact of continuity of village occupation from protohistory to the modern period at a large number of places demonstrates that the protohistoric villages closely adapted to the landscape and the agricultural possibilities

it offered. Finally, although an increase in the density of sites through time is a common feature in many of the areas where detailed surveys have been undertaken, this need not be taken as axiomatic. On the basis of an unpublished survey in the Peshawar plain in the north-west one may state that it was during the Kushana rule of the early centuries AD that the ancient settlement density of the region was at its peak. There was a fall in the number of sites after that period. Considering that under the Kushanas the area was a part of a political rule extending up to central Asia and witnessed intense trading activities along well-defined routes across the Hindukush and the Karakoram, this is easily understandable. It would be interesting if the long-term settlement history of a region can be studied with reference to its political and economic variables. Certain broad generalizations have already been made in this regard. As noted earlier, the history of urban settlement growth in India can be neatly correlated to three major phases of Indian political history: the seventh/sixth–fifth century BC, the third–second century BC and the early centuries AD. We would also draw attention to another point. The way ancient settlements expanded and eventually came to cover—thinly or thickly—different sections of a region may constitute an important part of the study of long-term settlement history. It is well known that in the Bhagirathi delta of West Bengal ancient settlements continued to flourish along an old course of the river till the twelfth–thirteenth centuries AD and perhaps a little later. But what is interesting is that this was a part of a long process beginning in the third century BC and earlier, and although there is no lack of early sites along this deserted channel to the south of Calcutta, the region as a whole, inclusive of parts of the modern Sundarbans, was penetrated by settlements only in the twelfth–thirteenth century AD. It would, in fact, be important to know the different processes and stages through which settlements grew in the major habitational areas of the subcontinent.

## AGRICULTURE

There is a strong uneven element in the beginning and growth of agricultural systems in different parts of India. If in the Kachhi plain of Baluchistan wheat-barley cultivation and cattle-sheep-goat domestication date from *c.* 7000 BC, the first full-fledged agricultural communities of West Bengal are not earlier than the second millennium BC, and there is no date at all from our large north-eastern region. So, while assessing the general range of data from various regional contexts, the basic unevenness of the story and the world of uncertainties behind it need to be kept in mind.

From the beginning of Mehrgarh Period I to the threshold of the mature

Indus civilization there is an agricultural history of possibly more than 4000 years stretching from Baluchistan to Panjab–Haryana and Gujarat. This history includes the cultivation, helped by ploughs, of wheat, barley, pulses, vetch, cotton, grapes (from Mehrgarh Period V onwards), mustard (suggested by the furrow-marks of the excavated field at Kalibangan) and possibly millets and rice. Millets were indisputably cultivated in the mature Harappan context in Gujarat, and thus had probably an early Harappan background. Moreover, millet occurs in the mature Harappan context at Shortughai. The presence of both rice and millet in the mature Harappan context at Harappa has been indicated by phytolith studies, which is hardly surprising in view of the possible presence of rice as early as the second half of the third millennium BC in Ghaligai periods II and III. Besides, the mature Harappan levels at sites like Lothal and Rangpur in Gujarat yielded rice. The agricultural history of the pre-Indus civilization context was obviously not dependent on a single crop or a single group of crops like wheat and barley. Millets and rice also seem to be a part of this history. In addition, cotton, fruits like grapes and dates, fodder like vetch, and oilseeds like mustard and linseed (Nausharo) formed parts of the scene.

It is doubtful if there was any major agricultural innovation in the mature Harappan context except the introduction of irrigation by innundation canals in the Indus-Hakra plain. The number of legume types is high now and includes even hyacinth bean (Mahorana, Sanghol). More interesting is the identification of henna (Rohira), jasmine and harsingar flowers (Sanghol and Rohira respectively), a plant substance used in shampooing hair (Dholavira) and a kind of poppy seed (Sanghol). The regional adaptations of mature Harappan agriculture are still imperfectly understood except that there was greater emphasis on millets and rice in Gujarat. Silk and cotton too seem to have been reported only from Gujarat so far. The late Harappan situation seems to be marked by a wider, if not better, amalgam of different crop types, with the cultivation of wheat, barley and millets making distinct inroads in the Doab (cf. Hulas).

It would be wrong to say that the basic crop list changes in the neolithic–chalcolithic contexts outside the Harappan distribution system, but the pattern of their combinations seems to have changed, and although the details are not available, allowance should be made for changes in the agricultural practices too. Rice came to be firmly ensconced in the hill valley of Swat, and an interesting discovery is that of a small ploughed field with furrow marks dating from *c.* 1300/1200 calibrated BC. It has been inferred that a plough-ard was used, moving earth automatically to one side of the furrow. In south-east Rajasthan, Balathal yields only wheat,

barley and millets, but rice occurs at Ahar. Rice seems to have been somewhat later in Malwa, but wheat and barley, perhaps the dominant crops, were present right in the beginning. The Maharashtra situation is better understood. Barley was the principal cereal along with millets. Wheat was grown, but only with the help of irrigation. Rice is reported (Inamgaon) but 'could have been raised in small carefully tended plots as is the case today'. The ard, if not the proper ploughshare, was used for ploughing. Antler was used as the tip of hand ploughs and hollow antlers possibly served the purpose of seed drills. Millets seem to have been the mainstay of economy in the south, although the antecedence of rice cultivation in the Krishna-Godavari and Kaveri deltas in the historic period deserves a thought. At present the presence of rice is limited to the megalithic context. Areca nut in the first half of the third millennium BC at Watgal is an important find, although only horse-gram and finger millet are reported from the later levels. Eastern India, from Orissa onwards, was possibly dominated by rice; in the neolithic context of Senuar this is said to be the principal crop. The extensive range of crops from these sites including Chirand suggests plough cultivation and a well-ordered agricultural regime. Rice must have been important in the north-eastern areas too, although no evidence is forthcoming. Rice apparently occurs extensively in the protohistoric contexts of the upper Gangetic valley (cf. Atranjikhera).

Whatever may be said about the Chinese and south-east Asiatic origins of rice cultivation, it is difficult to ignore the three early radiocarbon dates from the level bearing cultivated rice at Koldihawa, the calibrated ranges of which are 7505–7033 BC, 6190–5764 BC and 5432–5051 BC. In the context of the find of wild rice in the mesolithic context at the neighbouring site of Chopani Mando, this does not seem to be as much of an anomaly as it has been supposed to be. More work is certainly needed but even if one argues that the neolithic at Koldihawa cannot be earlier than the neolithic level of Kunjhun in the upper Son valley, it needs to be remembered that there is a fourth millennium BC (calibrated) date from this level at Kunjhun, and as far as one can see, there is no way one can explain even a fourth millennium BC date for domesticated rice in India by invoking Chinese and south-east Asian origins. As things stand, an Indian centre of origin of cultivated rice is a clear probability along with Chinese and/or south-east Asiatic centres. Moreover, the important position of rice in Indian rituals, its importance as the breath of life in early Indian literature, its innumerable varieties, its adaptation to different types of land and its wide distribution and varieties in wild form—all this goes a long way to underline the significance of India in the history of rice cultivation.[4] Although no evidence is forthcoming, it is

sensible to suggest that rice seeds were initially broadcast rather than planted first in nurseries from where they would be transplanted in the fields. The 'transplantation method', if the early Buddhist literature is any indication, possibly was entrenched in the middle Ganga valley by the beginning of the early historic period.

The regime of the domesticated animals seems to be fairly uniform at most of the sites: cattle, sheep, goat, buffalo, pig. However, in this case the emphasis should be on the types of uses to which they were put. Not much progress has yet been made in this direction, although butchering for meat and culling of herds seem to have been known.

The transition from the hunting-gathering stage to effective agriculture must have been a long process and varied to a considerable extent. It is important that this is understood in future. It is also important to realize that the history of our ancient agricultural systems should be more than the discussion on the areas and processes of domestication of the major crops including pulses.

Out of over 20,000 higher plant species found in India, only 778, belonging to 96 families, possess edible parts. There are 648 species which have single edible parts, and these include tuberous starchy roots and rhizomes (95 species), flowers or flower buds (46 species), fruits (383 species), seeds, including nuts and kernels (110 species), and other plant parts (14 species). The other 130 species have more than one edible part.[5]

Even if the problem of finding and identifying all these edible plant species is mind-boggling, attempts should perhaps be made to trace the utilization of tubers like taro and yams at least.

## METALLURGY

Although the richness and variety of India's metallurgical history has by and large remained outside the general historical perception of the land or been confined essentially to generalizations about the impact of the introduction of iron on agriculture, the abundance of her mineral resources, the richness of her pre-industrial metallurgical tradition, the antiquity and abundance of her ancient metal objects and the still unexplored dimension of her ancient mines should mark out India as a great metallurgical centre of antiquity. The investigation of this history is much more than trying to determine if particular textual terms meant particular metals or set down the nature of government controls over mining and metals on the basis of the *Arthasastra*. Basically, it is a matter of focusing on ancient mining and metallurgy as specific research problems not merely in archaeology but also in geology,

metal sciences, ethnography and history. However, not a single excavation in the subcontinent has been undertaken with the issue of ancient metallurgy in mind. Geological research on the distribution of various metals has no doubt been a serious concern of various relevant national bodies, but the resources which, despite their modern commercial unsuitability, would have been adequate for pre-industrial smelting and the locations and characters of innumerable pre-modern mining shafts have escaped systematic attention in the field. Public sector organizations like Hindustan Copper or Hindustan Zinc could at least have set up units (however small) to study the traces of ancient mining and mineral production in the areas under their control. But for a handful, material scientists in India have not been concerned with the scientific analysis of ancient artefacts. In view of the vast mass of ethnographic data available in the British Indian documents on the production of both metals and metallic artefacts and the continuity of various metal-based craft traditions in various parts of the subcontinent, the ethnographic understanding of the ancient data is also very significant in the Indian context. Historically, the production and the economic organization of metals and metalcrafts in some metal-rich areas of the subcontinent (cf. Rajasthan) before the coming of the British should tell us a lot about the traditional way of organizing metal industry.[6] On their part, archaeologists have been unmindful of the rich possibilities of investigation from all these points of view.

In recent years there have been several historical syntheses of the available material utilizing different types of sources, but as a scholar has commented, 'there is a certain sterility both of new material as well as of new ideas and approaches.'[7] There is much truth in this comment. Archaeologists can study the material basically from the point of view of its archaeological implications but they are ill-equipped to handle the specific questions of metallurgy or the implications of specific metallurgical features of ancient artefacts. That a proper history of the use of different metals in India can be written only through a proper synthesis of geological, archaeological, literary and ethnographic data was understood early in the twentieth century by a chemist, P. Neogi. However, the tradition set by him was soon lost in Indian archaeological literature. The present author and his associates have offered through their publications a consolidation and updating of Neogi's approach, with detailed comments on some major related archaeological issues. The other publications in the field are either technical studies of individual situations and artefacts without a proper archaeological and historical perspective or general essays biased towards literary data. The matter rests here at the moment but it is important that we go beyond it.

Copper metallurgy was effectively established at Mehrgarh in Period III (crucibles with metal sticking to them), *c.* late fifth/early fourth millennium BC. By the close of the fourth millennium BC, the knowledge of copper and copper-related metallurgy, gold and silver became widespread: copper (with lead and nickel alloying), lead, arsenic and silver at Nal in Baluchistan in the middle of the fourth millennium, the extensive development of copper metallurgy in the Aravallis by the end of this millennium, and some areas around it about this time (cf. Dholavira in Kutch, Kunal in Haryana). There is a possibility of deliberate lead and arsenic alloying to the extent of 1 per cent in two analysed specimens from Ganeshwar in the Aravallis. It appears that by this time the major copper sources of the area in Baluchistan, Rajasthan-Haryana and Gujarat were known and used: the Las Bela source of copper in Baluchistan, lead in south-central Baluchistan, the Aravalli source in Rajasthan-Haryana and the Amba Mata source in Gujarat. The major problem is the big spread in the Aravallis: the profusion of both Ganeshwar-type sites and artefacts in this region, along with the fact that this growth apparently took place in the context of a microlith-using level which was a continuation of the earlier true mesolithic level. The evidence both from Ganeshwar and Bagor (possibly Langhnaj as well) is unambiguous on this point. The establishment of the Aravallis as one of the oldest and long-standing areas of ancient Indian metallurgy and the realization that it played a major role in the origin of the Indus civilization by being a major element in the intensification of craft activities before its beginning must be considered a major step forward in the archaeology of this period.

Given their background and the complex economic life of the civilization, it is no wonder that the craftsmen of the mature Harappan civilization were adept in making not merely a wide range of artefacts but also in using an extensive series of alloys: tin, arsenic, lead, nickel, tin and arsenic, tin and lead, arsenic and lead, tin and nickel, lead and nickel, and finally, zinc. Tin was the most widely used alloy, but it is the pure copper tradition which dominated. This fits in with the continuing tradition of ritual purity of pure copper vessels among Indian craftsmen.

On the whole there is absolutely no reason why the Harappan craftsmen had to import any metal or metallic ore from anywhere beyond the Hindukush. The north of Afghanistan could have played a role in supplying tin, but in the Tosham area of Haryana, which is right in the middle of Harappan distribution, there is an extensive deposit of tin. As far as the typology of Harappan copper objects is concerned, types like spiral-headed pins, which were once championed as west Asiatic imports, are now being found to have been very much a part of the subcontinental complex from Manda

in Jammu to Ganeshwar in Rajasthan and Inamgaon (early Jorwe level) and Daimabad (late Harappan level) in Maharashtra. It is also clear that some of the basic techniques and style of modern Indian craft tradition in copper and its alloys (including the *dhokra* tradition) and gold and silver jewellery go back to the Indus civilization context.

Another major development has been the realization that the Rajasthan-Haryana zone of copper metallurgy supplied finished tools and other products to Malwa and Maharashtra in the neolithic–chalcolithic context. The Aravalli zone signature is clear on the copper celts from Kayatha and we believe that the specimens of the late Harappan 'Daimabad hoard' went there from the same region. In the case of the upper Gangetic valley 'copper hoards', now identifiable with the OCP tradition of late Harappan affinity, the linkage is clearly towards the Rajasthan-Haryana zone of metallurgy. What is perhaps more significant is the spread of this tradition 'outside their core area, over a wide geographical area involving Gujarat, the Deccan and southernmost reaches of Tamilnadu.'

We believe that the specimens from Mehsana in Gujarat, Navdatoli, Chandoli, Kallur, Moongalar and Ramanathapuram belong to the same strain and are spread along clearly defined routes linking these areas with northern Rajasthan and southern Haryana.[8]

The picture of metallurgy in east India is not particularly varied or early; by the first half of the second millennium BC copper metallurgy seems to be secure (cf. Senuar with its crucible; flat axe from Mahishdal), although that is no reason to place the Chhotanagpur plateau and West Bengal 'copper hoard' finds so early. They dated certainly from the historic periods. More interesting is the opening up of the tin source of the Chhotanagpur plateau in the second millennium (Sonpur in Bihar, Bahiri in West Bengal) BC. Copper-smelting occurs in the chalcolithic context at Golbai in Orissa and should date from the second millennium BC. High arsenic alloying from the early first millennium BC context at Sankarjang in Orissa is interesting and suggests a separate strain of copper metallurgy. The source of tin in a copper object of the neolithic level of Brahmagiri in Karnataka is interesting too. Unless some local source was used, there is a possibility that the rich deposit of tin in Bastar came to be exploited by this time. But as no archaeological research has been done in Bastar with this proposition in mind, nothing positive can really be said in the matter.

High tin alloying, which has survived in Kerala, was certainly a part of the Indus civilization tradition (examples of more than 20 per cent tin alloying from Kuntasi and Mohenjodaro). This point has been missed by S. Srinivasan and I. Glover in their technological study of the surviving

Kerala tradition.[9] However, this tradition is more marked and widespread in early historic India from Taxila to the Asura graves of eastern India and the Nilgiri graves of Tamil Nadu. Occasionally, the tradition may also be observed among later images and coins. A distinct feature of the early historic context is the production of brass (cf. Taxila).

A major development in the study of ancient Indian metallurgy since the mid-1970s has been the mounting evidence of the early antiquity of iron technology in different parts of the subcontinent: Gufkral megalithic in Kashmir, Ahar Ib and Ic in Rajasthan, iron as a part of the continuing chalcolithic black-and-red ware sequence in eastern India, iron as a part of the continuing chalcolithic pottery sequence in Malwa, iron with early megalithic graves at Hallur and Kumaranahalli, iron with the pre-painted grey ware, black-and-red ware level at Jakhera, iron in the black-and-red ware context at Raja Nal-ka-Tila in Sonbhadra district, UP, and finally, an 'iron object' in the Harappan context at Lothal. The combined evidence is unequivocal enough to suggest that right from the early part of the second millennium BC there was a steady growth in the familiarity with iron in different parts of the subcontinent and that towards the closing centuries of the second millennium BC it was inducted into the economy of the Ganga plain. The fact that early historic urban growth in this region was not possible till several centuries later is sure enough indication of the fact that the impact of iron on the economy was slow.

## Trade and Trade Routes

Our perspective of early Indian trade has taken a few major leaps in the last two decades or so. One of these has been a rigorous delineation of the external trade of the Indus civilization: the minutiae of relevant artefacts, their contexts and chronology, the routes involved, the problem of 'overland trade versus maritime trade', and the context of this trade in the overall pattern of historic and still continuing trade over the entire region. It was important that these issues were sorted out from the Indian point of view before the significance of this trade could be properly evaluated in the Harappan context. Regarding India's external trade during the historic period, the primary emphasis has so far been on the textual sources, both of India and the Mediterranean world, and on the Roman coin finds. In recent years, however, there has been an increasing attempt to explore different types of non-numismatic data beyond these traditional sources. Occasionally, such attempts have been marred by more enthusiasm than is necessary, but we are now better informed about the different types of Roman artefacts in India as trade goods. By the time of Periplus of the

Fig. 56 Complete Roman amphora from the Contai area of coastal West Bengal (reported first by Chakrabarti et al., 1994)

Erythraean Sea (*c.* middle of the first century AD), the Indian coastline and ports and the products exported and imported through them were well known to the Romans, and it is not unreasonable to take the beginning of this knowledge and contact a couple of centuries earlier. The peak point should be the first two centuries AD when there are a large quantity of Roman or Rome-inspired antiquities in different parts of India, especially in west, south and east India. This is the time when one finds potters in the Bhagirathi delta turning out terracotta heads of males with laurel-leaf wreaths around their heads. The idea that the Bengal coast did not play a role in the Roman trade flies in the face of the archaeological data, inclusive of a complete Roman amphora, from this region. Further, the finds of innumerable Roman coins of gold, silver and even copper can now be better appreciated historically, thanks to D.W. MacDowall's clear assessment. He refers to the currency reforms undertaken by the Roman emperors Nero in AD 64 and Vespasian in AD 70 and argues that

> . . . most of the gold, silver and later Roman copper coins found in India were exported from the Empire after major currency reforms. It was a direct result of these reforms that older coins still in circulation from earlier issues came to have a

significantly higher metal content than the same denominations currently being issued, even though both had the same nominal value in the Roman monetary system. Following the principles of Gresham's law, the old coins of higher intrinsic value would in due course be withdrawn by the mint for recoinage, hoarded, melted down by jewellers and others for bullion, jewellery, plate, etc. or exported where the recipient valued it for its bullion.

. . . we must now revise substantially the dating of the periods when these categories of coins in silver, gold and copper were exported to India—the *aurei* and *denarii* of the Julio-Claudians struck before Nero's reform in AD 64 to the Flavian period (AD 70–98) and Trajan (AD 98–117); Republican *denarii* to the principates of Trajan (AD 98–117) and Hadrian (AD 117–138); *aurei* struck after Nero's reform mostly to the middle and later second century AD; and later Roman copper coins to the fifth century AD. It will be seen immediately that these periods do not correspond either with the dating evidence of trade contacts derived from the amphorae and *sigillata* finds or with the literary evidence of trade contacts and incidence of embassies.

This is hardly surprising. The dating of the amphorae finds properly indicate the period of trade in wine, oil and other products for which amphorae were employed; the dating of the *sigillata* indicates the periods when the rare sets of dinner plates were imported from the west; and the revised chronology of the export of these coinages indicates the periods when Roman traders found it more profitable to export coinage (much of it worn and demonetized) instead of metal in other forms. Pausanias, writing in the mid second century AD, describes the non-monetary character of trade with India, confirming what one would have expected that trade was by barter and did not use money as a medium of exchange even when coins were being traded.

In short, the trade in coins was simply part of the much wider trade in metals, at limited periods when traders found that the use of gold coins, exceptionally, the most advantageous way for them to supply gold, silver and copper.[10]

This is a very important step in understanding the significance (or, in a sense, the lack of it) of the distribution of Roman coins in India. If these are parts of only a trade in metals, it is not necessary that the find of a Roman coin somewhere in the subcontinent should indicate direct or indirect contact of that area with the Roman world. The evidence of such contacts, which no doubt existed in great measure, should be sought in routine archaeological materials.

Archaeologically, the understanding of Roman trade cannot be said to have significantly advanced even after the recent excavations at Arikamedu and Kaveripattinam, both on the Tamil Nadu coast. However, a very large part of ancient occupation at Arikamedu is still undisturbed and lies unexcavated.

The study of India's historic trade with south-east Asia has, regrettably, not gone much beyond the traditional sources of literature and inscriptions. Despite attempts by scholars, the archaeological basis of this trade is not

well defined and is limited principally to the finds of etched carnelian beads, rouletted ware, etc. This sharply contrasts with the intensity of contact between these two regions, that we know of from art, architecture and inscriptions. However, the find of etched carnelian beads, typical of the early historic Indian assemblages, in some quantity in the fourth century BC context at the western Thailand site of Ban Don Ta Phet is significant and has at least offered an early chronological marker of India–south-east Asia contact.

The overseas trade network is no doubt exciting and conjures up a rather romantic vision of a world operating, so to speak, on its own in the high seas—the Indian Ocean in this case. The prospect of 'Indian' coastal trade, i.e. the trade pursued by Indian coastal vessels and merchants in different sections of the Indian coast, is, of course, far less romantic but could be equally significant in relation to the internal trade network of the subcontinent. This aspect has more or less been ignored in studies of ancient Indian trade. V.D. Gogte's premise that rouletted ware was made of the clay of the lower Ganga plain raises important possibilities.

A major breakthrough has been achieved in recent years by a careful study of the distribution of various raw materials at protohistoric and some early historic Indian sites, the possible source/sources of these raw materials on the basis of the geological distributions of these materials, and the possible lines of movement of such materials both in the light of archaeological site distributions and the historical and ethnographic data on these lines of movement. What has emerged is a very extensive series of geographically well-defined networks of contact all over the subcontinent right from the protohistoric period to about 200 BC. The early historic pattern is strongly rooted in protohistory. By *c.* 200 BC and possibly considerably earlier, the whole of the subcontinent was within an integrated communication chain; there was no difficulty at all in moving down from Taxila to the deep south or from the sub-Himalayan tract to the Bhagirathi delta. The north-west had, as we have emphasized time and again, its network of communications with Afghanistan, central Asia, Iran and beyond. These routes are geographically constricted and well defined.

The locations of major sites or inscriptions in certain sectors also have their own geographical implications. For instance, the location of the Asokan edicts at Shabazgarhi and Manserah in the north-west is in an area where the famous Silk Route or the Karakoram route begins with central Asia as the objective. This suggests that in the Mauryan scheme of things central Asia and/or China were significant. The Mauryans must have had some knowledge of China. Similarly, the location of two Asokan pillars at Rampurwa near the Bhikna Tori pass on the Nepal border implies that the

Kathmandu valley, the road to which went through this pass, must have been important in the Asokan administration. Again, the location of a Mauryan provincial capital at ancient Pundranagara or modern Mahasthangarh in Bagura district of Bangladesh underlines the possibility of the Brahmaputra valley being within the Mauryan kingdom, although there is as yet no direct evidence for it. The location of the early historic site of Wari Bateshwar in the Meghna delta of Bangladesh suggests that the ancient Samatata tract, in which this site is located, was a part of the Mauryan kingdom. This further means that the Mauryans would have had no difficulty in extending their power up to the Chittagong coast. The point is that the geographical nuances of archaeological locations have to be worked out area by area.

Of the major axes, the first is from the north-west to the Bengal delta, with many offshoots all along the way. One of its major offshoots goes in the direction of Sind from about the region of Taxila. From Sind, again, one can easily move to Kutch and the mainland Gujarat coast which gives access to central India and the Deccan, or, from Sind one can move towards Haryana-Delhi through the Hakra-Ghaggar system. Once the trunk-route from the north-west reaches Delhi-Mathura, it is easy to branch off in the direction of Rajasthan and Gujarat. Through the Malwa plateau adjacent to Rajasthan one moves towards the Deccan and west India. Moving further towards the east, a major line takes off from the area of Allahabad towards central India through the Baghelkhand region, while another line goes towards central India and the Deccan from the Banaras sector. From the Banaras sector it was also possible to enter the hills, reach Garhwa on the Son at the fringe of Palamau and move through the hills and some open valleys towards Keonjhar and the Orissan coast. At some point along this line one could break off and leave in the direction of modern West Bengal to reach the ancient port of Tamralipta. The trunk route to the Bengal delta followed the southern bank of the Ganga in Bihar and went through the narrow strip between the Rajmahal hills and the river to reach the delta. From this delta one could go to Orissa on the one hand and Assam or the Brahmaputra valley on the other, without running against any major geographical obstacle. The route to Arakan was open too from the Samatata area (roughly, the area of modern Comilla). From the Brahmaputra valley there could be several routes in the direction of Bhamo in northern Myanmar with south China in mind, whereas there could be communication lines with Tibet through the Chumbi valley, Bhutan and perhaps the Sadiya region. If one targeted the Chhattisgarh sector of central India from the Allahabad-Banaras sector, it was possible to reach it by travelling across the central Indian hills and then moving from Chhat-

tisgarh to north Orissa or Vidarbha. The routes in the interior of the Deccan and the west coast are clearly marked and in any case dotted with archaeological sites and monuments. From this sector there was no difficulty in reaching Hyderabad and eventually the Krishna-Godavari delta in Andhra, from where the route to the deep south was entirely open along the Tamil Nadu coast. There was another route to southern Deccan through western Andhra, and once in southern Deccan (part of modern Karnataka) the routes further south were easy. The Kerala coast was accessible through the Palghat gap.

It is along such lines that the tapestry of ancient Indian trade and trade routes (and some history as well) has been woven. This tapestry is, in the long run, far more exciting than following vessels across the sea and enumerating ports and coastlines. In a way, this tapestry is still in the field before us and all that one has to do is to go out and look for it. If the Mauryan king Asoka visited Lumbini, the birthplace of the Buddha, travelling from his capital Pataliputra, he must have travelled in the direction of Arrah and Buxar, crossed the Ganga at or near Buxar for Ballia, possibly stayed at the fortified early historic site of Pukka Kot in the Balliah area and gone in the direction of Khairadih, another fortified city site, on the bank of the Sarayu. He must have crossed the river at Khairadih, because on the other bank there is an uninscribed and broken shaft of a Mauryan column. From Khairadih he possibly passed through Sohgaura and Kopia to reach Basi, still the most important approach point for the Lumbini-Kapilavastu area. There was a major route also along the northern bank of the Ganga, which sent offshoots towards the sub-Himalayan tract in the north frequently along the way. The archaeological details of the history of all these internal routes of the subcontinent are known only in patches. Much remains to be done.

The journey from the subcontinent's palaeolithic beginnings to its early historic foundations is no doubt very varied, and, of course, very long. Also, much of it can be seen only in patches. If this journey can be compared to travelling along the bank of a river, we have tried to follow its course in this volume as much as we can, sometimes moving close to the main flow and sometimes being forced away from it. This flow has no doubt meandered all over the land, taking many tributaries along the way. The gurgling of the regional tributaries does not, however, detract from the quiet and majestic flow of the main stream.

# 'Afterword':
# Ideas and Discoveries in Indian Archaeology, 1998–2008

Although the developments in Indian archaeology since this book was written in 1997–8 do not necessitate any basic or even appreciable change in its structure, argument, and contents, their implications have to be understood and put in their proper contexts.

## Introductory

The development of archaeological research in the subcontinent has gained some academic attention, leading to a better idea of the details.[1] One also notes a concern with the socio-political dimensions of archaeology in modern India.[2] The geographical approach to the subcontinental archaeology has not yet attracted the attention it deserves, and one hopes that with the increasing attention to the grassroots details of routes,[3] etc., there will be a better re-shaping of our relevant archaeo-geographical concepts. As far as the basic classificatory frameworks of the Indian people and languages are concerned, there has been no major development except the increasing frequency of DNA studies of various population groups. They throw light on the molecular make-up and possible links of various populations. For instance, in a study published in 2000, Kivisild *et al.*, argued that India could be 'a part of the common gene pool ancestral to the diversity of human maternal lineages in Europe'.[4] In 2006 Sahoo *et al.*,[5] observed that the Y-chromosomal data

consistently suggested a 'largely South Asian origin for Indian caste communities' and therefore argued 'against any major influx, from regions north and west of India, of people associated either with the development of agriculture or the spread of the Indo-Aryan language family'.

The literature of DNA studies on the Indian tribal and caste populations is fast increasing, although not yet consolidating into a range of clear historical conclusions. No prehistoric DNA has yet been isolated in India. So far the only past DNA isolated in India has been on the AD 9th century human bodies buried in the Rupkund glacier of the Garhwal Himalayas.[6] In this context it is important to remember that the biological ingredients and ancestries of human population groups do not have specific archaeological or historical correlates.

## The Hathnora Fossil Finds

'Hominin' has recently replaced the earlier term 'hominids' in the case of the early human fossils. After its initial discovery in 1982, the hominin-yielding locality of Hathnora yielded from the same deposit a partial left clavicle and a left ninth rib. Both these pieces and the earlier finds have been supposed to represent a single individual, possibly a 25–35 year old female who was 135 cm (4 feet 4 inches) tall and had a modern pigmy body-frame characterised by a very robust body build.[7] A further analysis ascribed[8] the Hathnora skull cap to the lower part of the Middle Pleistocene beginning around 500,000 years Before Present (BP). If accepted, this would put the Hathnora find in the *Home erectus* category and not in the category of *Archaic Homo sapiens*, as thought earlier.

However, in the case of such old specimens, scientific unanimity is difficult to achieve. Some recent researches have led to specific insights into the depositional context of the Hathnora specimens.[9] The geological profile of the area is currently the succession of the following 'Formations' (beginning at the bottom): Pilikarar, Dhansi, Surajkund, Baneta, Hirdepur, Bauras, and Ramnagar. The Dhansi Formation is placed between late Pliocene and early Pleistocene epochs. The reported vegetational sequence of the area[10] begins with the Surajkund Formation. It shows sparse grassland with vegetation indicative of arid climatic conditions. The subsequent Baneta Formation, roughly 24000–20000 BP, denotes a landscape with open vegetation and the presence of waterbodies, which may indicate a cool dry climatic regime. At 8740 plus/minus 450 Yrs BP there was dry deciduous forest in the area, which suggests climatic amelioration. The basic conclusion is that in the early middle

Pleistocene, the climate was warm with intermittent arid–humid phases. The terminal part of the Pleistocene was drier. Three mammalian teeth stratigraphically associated with the Hathnora fossil finds were dated by the Electron Spin Resonance (ESR) method and showed the minimum possible age for this level at 49 plus/minus 1 thousand years ago (Ka). However, these teeth could have been reworked and deposited into the Hathnora bed at any time after 160 Ka or earlier.[11] Thus, many of the present conclusions about the Hathnora hominin find are tentative. In view of the Pliocene to early Pleistocene dating of the Dhansi Formation, a remarkably interesting find is that of a few *in situ* Palaeolithic artefacts (generally in fresh condition) and a highly weathered fossil herbivore tooth from a thin rubble horizon at the bottom of this Formation.[12]

## Palaeolithic and Mesolithic

M.Salim,a Pakistani archaeologist, has found stone tools in the Gurha Sahan area of Rawalpindi in the Upper Siwalik Conglomerate and the underlying Pinjore Formation.[13] The latter has been put around 2 million years ago (mya) by the study of its magnetic polarity stratigraphy,[14] and thus there need not be any doubt about the 2 mya occurrence of the first stone tools in the Siwalik zone. The claim of 1 mya dating of the Isampur Palaeolithic quarrying site in the Hunsgi-Baichbal valley of Karnataka is disputed,[15] though this quarry site where limestone blocks were quarried and carried some distance by the makers of Palaeolithic tools remains a unique site in Indian archaeology.[16]

It is unique in the sense that for the first time a close study could be made here between the raw materials, which in this case, are slabs or chunks of limestone, and the manufacturing process of the tools. A degree of forethought and decision-making has been clear in this process.[17]

The basic distribution pattern of the Palaeolithic industry remains more or less unchanged. The southernmost occurrence has gone as far south as Tanjore, and in the northeast a fossil wood industry, perhaps similar to the fossil wood industry found already in Tripura and Bangladesh, has been located in Mizoram.[18] This fossil wood industry is upper Palaeolithic and has close analogues with the upper Palaeolithic Anyathian industry near Mandalay in Myanmar.[19] Lower Palaeolithic tools have also been reported from the Palghat district of Kerala, although one does not yet know if they form a distinct stratigraphic level or are stray finds of artefacts. The information on the environmental conditions of the Indian lower Palaeolithic still remains inadequate, and despite a focussed multi-disciplinary research programme at

the site, the Attirampakkam Palaeolithic industry of the Cortalayar valley near Chennai has not told us anything historically significant except that the site was originally located near the banks of the Cortalayar and that the tools were used and discarded there to be subsequently covered by a flood of the river.[20] There has also been no breakthrough in the chronology of the site. The ESR dates of its three fossil teeth are not earlier than 50/51 Ka, which possibly means that these teeth, obviously of a much later period, subsequently got mixed up with the bed containing the Palaeoliths.

It is increasingly clear that there are many uncertainties about what can be inferred from the deposits containing early Palaeoliths even through scientific research. Geological and geomorphological informations which fill up sizeable portions of modern Palaeolithic research publications in India seldom give us any dependable historical conclusion.

At 74000 years BP, the Toba volcanic eruption of Sumatra was strong enough to lay thick ash deposits in Peninsular India. Such deposits have been traced in the eastern part of the Vindhyas, the geologically old western part of West Bengal, Karnataka, and Maharashtra. The geochemical composition of these deposits tallies strongly with that of the Toba ash. A 'catastrophe theory' got built up in the scientific literature around this event, on the basis of the proposition that much of the earlier life was seriously disrupted by the calamity of the Toba eruption. A recent study based on the middle Palaeolithic profiles shows steady artefactual continuity between the pre-ash and post-ash deposits in India and thus undermines the 'catastrophe theory'.[21] Much of the present conclusions about the arrival of Anatomically Modern Humans in India from Africa is tentative. The event could have taken place sometime in 70000–50000 BC or even later, but the continuity of the Indian lithic sequence still makes it impossible to identify specific fresh arrivals from Africa. The decorations on the ostrich eggshell beads at Patne, which have been invoked by some as an African correlate, do not really imply anything like that because the Patne sequence from the middle Palaeolithic to the upper Palaeolithic and Mesolithic is uninterrupted and continuous. In the name of Palaeolithic research much scientific posturing has begun to take place in the modern Indian context,[22] making confusion worse confounded.

At Kalpi on the right bank of the Yamuna on the way to Kanpur from Jhansi, three 'events' have been isolated in a dated prehistoric profile, with the base of 'event I' being a sand deposit of 76 plus/minus 11 Ka. This was a phase of moderate to dry climate. The interface of the 'event I' and 'event II' (69 plus/minus 13 Ka) contains quartzite flaked pebbles and worked bone artefacts along with a large elephant tusk and other mammalian remains. The climate of 'event II' is said to be humid and its mid-level is dated 45 plus/

minus 9 Ka. The basal section of 'event III' (humid in its lower part and dry in the upper part) is dated 43 plus/minus 7 Ka. In view of the location of the site in the alluvium at the western edge of the Ganga plain which is otherwise considered outside the belt of prehistoric finds, the Kalpi discovery[23] is of great significance. The fact that bone artefacts have been found here in the middle Palaeolithic lends this site added significance.

A major upper Palaeolithic discovery has taken place at Ango Patkai in the Northwest Frontier area of Pakistan where a Sanghao-type cave site has been found to contain both stone and bone tools. [24] The finds of bone tools in the Palaeolithic assemblage of the Kurnool caves of Andhra, the Kalpi profile in Uttar Pradesh (UP) and the rock-shelter site of Ango-Patkai of Bajaur clearly indicate that the occurrence of bone tools in the sub-continental Palaeolithic is much more widespread than previously thought.

Except the excavations at Jwalapuram in the Kurnool district of Andhra, which have established a sequence of Mesolithic industries between *c*.35000 and *c*.12000 calibrated years BP in association with four cranial vault fragments, an isolated tooth, pieces of red ochre used for rock painting and stone beads, there has been no major Mesolithic excavation in the past decade. Dates of the 7th to the 10th millennia BC have been obtained from the sites of Lekhahia, Mahadaha, and Damdama. These show that there need not be any doubt about the early status of the Mesolithic in the Gangetic plain and the Vindhyan fringe.[25]

Regarding the other Stone Age discoveries, one must mention the work on the rock-shelter site of Daraki–Chattan near Mandasore in Madhya Pradesh. Excavations have shown that the context of the many cupules found on the rock-shelter walls is a transitional phase between the lower and the middle Palaeolithic, proving that cupules have an ancestry stretching back to the Acheulian in India. Further, two engraved lines on a boulder have also been found to date from the Acheulian phase.[26] The Stone Age research in the subcontinent has amply underlined the tremendous chronological span of the hunting–gathering tradition which can still be observed in various areas, and from the historical point of view this research offers insights into how the landscape was used by hunter–gatherers in the prehistoric context.

## Early Agriculture

Developments of fundamental importance have taken place in the field of early agricultural beginnings in India. Two areas have emerged into limelight: the central Ganga plain and its Vindhyan fringe, and the Aravalli system. That this problem is much more than the issue of tracing the beginning of

early wheat and barley agriculture in the subcontinent in Baluchistan and then tracing its development in what is occasionally characterized as the greater Indus valley and linking it to the development of the Indus civilization, is highlighted by some recent work in the Kotumsar and Dandak caves of the Kanger valley national park of Bastar.[27] Pottery, tool, or hearth could not be identified in the interior of these dark and generally inaccessible caves, but traces of fire have been found on the floors of both of them. Inside Kotumsar, about 100 m from the cave mouth, four carbon-rich samples were collected from a 32 cm thick section. Three such samples were collected from a 14 cm thick section in Dandak, about 170 m inside from the cave mouth. These carbon-rich samples have yielded dates and plant remains. It has been found that these caves were occupied or used by human groups in 4990–2080 (calibrated) BC. The plant remains indicate three types of grasses and two types of millets. One of these grass varieties is locally called *Chenchrus* which are still cultivated in some areas as fodder. Another variety is known as *Sirwari* whose leaves and tender shoots are still used as food. The identified millets—foxtail millet and another millet of the *Setaria* group—are still collected in the area as edible foods.

The Kotumsar and Dandak cave evidence of early plant collection is no doubt indicative of a wide tradition of such plant usage in Indian late prehistory as a background to the more unequivocal evidence of agriculture. The phytoliths of wild rice, which have been identified around the site of Lohuradeva in the Gorakhpur area at about 8250 (calibrated) BC may also indicate such a tradition of collecting wild grains as a prelude to full-fledged agriculture .

The 8th–6th millennia BC evidence of domesticated rice at Koldihawa in the Vindhyan fringe of the central Ganga plain was published in 1980. Chopani Mando of the same area yielded in its 'advanced Mesolithic' or 'proto-Neolithic' level wild rice, thus suggesting the possibility of rice cultivation in this part of the Vindhyas. Kunjhun in the Sidhi district of the eastern Vindhyas, showed the use of both domesticated and wild rice in the 4th millennium BC. The evidence of domesticated rice has been claimed for the 8th millennium BC at Damdama near Pratapgarh in the plain. The 8th to the 6th millennia BC dates have sporadically emerged for the Neolithic levels of sites like Jhusi (on the left bank of the Ganga in Allahabad) and Tokwa (the Mirzapur belt of UP). Thus, there have long been clear indications that the central Ganga plain and the adjacent upland of the eastern Vindhyas constitute an early and independent centre of the beginning of rice agriculture.

The clinching evidence has emerged from Lohuradeva (220m x 140 m x 4 m), a village on the bank of a *tal* or marshy depression in the Gorakhpur-Basti area of eastern UP. Studies of geomorphology, pollen records, phytoliths,

diatom, and micro-charcoal were undertaken along with the excavations at the site. The presence of micro-charcoal in the 2.8 m thick succession of sediments in the marshy depression, on the bank of which the site is located, suggests slash-and-burn cultivation around 10000 BP. This is supported by the evidence of cerealia pollen and micro-charcoal in the sediments of Sanai Tal in the Lucknow area since 15000 BP. The related evidence from Dadupur (near Lucknow) and Bateswar (near Agra) attests 'human activity' in a larger area of the Ganga plain during the late Pleistocene and early Holocene. The domesticated rice found in the lowest archaeological deposit of Lohuradeva has been dated 8259 BP (calibrated) or 6309 BC. The phyoliths and cerealia pollens in the lake sediments indicate well-developed agriculture in the area in the 7th–6th millennia BC.

Period 1 of Lohuradeva has been divided into two phases. Period IA represents a 45 cm thick *kankar*-mixed deposit. The red ware and black-and-red ware, the two main types of pottery (all handmade) in this level are ill-fired, possessing coarse and porous surface and uneven core. The clay used for this pottery is mixed with rice husks and straw and not well-levigated. About half the pottery of this level is black-and-red ware, the inner core of which is about two-third black and the rest red. Both the pottery types bear slips on the inside and outside. The slip in the case of the black-and-red ware is black while the slip in the case of the red ware is red. The slip on the red ware is very fine in some cases. There are cord impressions including rope designs, on the red pottery. The pottery shapes common to both black-and-red ware and red wares are convex-sided bowls, pedestalled bowls, knobbed vessels, and miniature bowls and vases.

Burnt clay chunks and nodules with reed impressions show that the houses were made of wattle-and-daub. There are traces of circular mud-floor, postholes, and hearths. An irregularly running channel (23 to 53 cm broad but the depth is still uncertain) has been traced through the settlement for about 12 m.

Layers of compact yellowish earth mark Period IB. The earlier pottery types continue to occur, but there are new additions including grey and black wares. The pottery of this level seems to be finer in comparison with that of the earlier level. Only a single sherd of painted pottery (a linear design in creamy white colour on a fine dark red—slipped surface) has been found. Beaker, perforated and legged vessels, and spouted vessels occur as new pottery shapes. The houses continued to be made of wattle-and-daub and there are mud floors with hearths. A terracotta sling ball, a bone arrowhead, steatite beads, animal bones showing cut marks, and plant remains constitute the other excavated material. Period IB has been dated in the late-third and early-second millennia BC (calibrated).

The climatic sequence of Lohuradeva began with a cool and dry climate in which the vegetation comprised grass interspersed by few trees and thickets. This lasted at least up to 6750 calibrated BC. There was an increase in rainfall between 6750 BC and 3750 BC (calibrated), resulting in an increased vegetation in the area. After about 3750 BC(calibrated) there was vegetation with patchy forests of *Mahua* and *Sal* trees. The use of copper and iron is attested around 2050 BC and 1250 BC respectively.

The fully domesticated rice in the lowest level of Lohuradeva occurs in association with both wild rice (*Oryza rupifogon*) and foxtail millet (*Setaria* sp.). They occur intermittently in several layers in association with other wild seeds and fruits. Barley appears at the site around 2700 BC (calibrated) and wheat a little after that. Rice was present throughout.[28] After a long spell of research beginning with the excavations at Koldihawa, Chopani Mando and other sites, Lohuradeva has provided the clinching evidence of the independent and early beginning of rice cultivation in this part of the subcontinent. Its ramifications in the other areas of the Ganga plain still remain to be traced.

The claim of the Aravalli system as an early and independent centre of agricultural origin is getting increasingly strong. First, we may consider Bagor in Bhilwara. The fact that cattle, sheep, and goat of Period I at Bagor were domesticated and the fact that the earliest chronological point of this period falls in the 6th millennium BC suggest the possibility of Bagor I having an agricultural component. In the next period Bagor yielded copper implements, of which the arrowhead is identical with the arrowhead type of the subsequently excavated site of Ganeshwar (located between Kot Putli and Nimka Thana), located further up the Aravallis. In its first phase Ganeshwar was exclusively marked by microliths but possessed a number of copper tools in the next phase itself. It has not been generally realized that Bagor and Ganeshwar in two different sections of the Aravallis have the same archaeological sequence. It is likely that Ganeshwar I and Bagor I belonged to the same period, i.e., the 6th millennium BC and Ganeshwar also had an agricultural dimension like the latter site. The 6th millennium BC date for the so-called Mesolithic level in the Aravallis has also been highlighted by the mid-6th millennium BC date for a 60 cm thick Mesolithic deposit on the eastern face of Gilund-2 (Bhilwara district where Bagor is also situated). The issue needs further research, but what is intriguing is that the beginning of the chalcolithic occupation at Balathal in the same region has now been found to be about 3700 BC (calibrated). This implies a considerably earlier beginning of agriculture in the region, and as there is no reason to infer that

this beginning was due to an infiltration from another area, one has to accept that this suggests an independent beginning of agriculture and metallurgy in the Aravalli zone.[29]

On the whole, it appears that the subcontinent had clearly developed early pockets of agriculture based on different types of cereal crops: the tradition based on the cultivation of wheat and barley around 7000 BC in Baluchistan, and the tradition based on the cultivation of rice in the central Ganga plain and the adjacent uplands at about the same period. The crop situation in the presumably early development of agriculture in the Aravallis is still unknown. The northeast, a distinct agricultural zone of the country where terrace agriculture is practised widely along with slash-and-burn agriculture, has not yet been researched at all from this point of view, but may be important in this regard in future. The situation in the southern peninsula is uncertain, there being no reason yet to push the date of the beginning of its agriculture beyond *c*.3000 BC. It is also probable that throughout the subcontinent, there was a deeply embedded tradition of the collection and use of a wide variety of wild plant products including seeds of millets, as we have found in the Kotumsar and Dandak caves of Bastar.

It is historically important to appreciate the point of multiple agricultural origins in different parts of the subcontinent. For instance, the Indus civilization has so far been viewed primarily as the product of a straight arrow-line of development of wheat-barley agriculture originating earlier in Baluchistan. In view of the early rice-based agricultural centre in the central Ganga plain and the probable independent growth of agriculture and animal domestication in the Aravallis which might also include an extension in Gujarat, contributions of different strands of agriculture to the Indus civilization are more than likely. It has long been known that this civilization was based on a number of major crops—not merely wheat and barley but also rice and millets, and it is somewhat regrettable that not enough attention has yet been paid to the issue of its agricultural diversity and the impact of this diversity on its origin and development.

## The Indus Civilization

Among the recent discoveries in the northwestern part of this civilization, firm archaeological sequence has been obtained from Nal in Baluchistan (the website of Deutsches Archaologisches Institut) and the Gomal plain of the Northwestern Frontier region.[30] Nal is a well-known site but till now there were uncertainties about its sequence and chronology. In Period I when it is

found related to the Togau level of the neighbouring Kalat plateau, there was a cemetery with fractional secondary burials. The individual graves contained the remains of up to 16 individuals of all age groups, and plenty of grave goods, mostly pottery and beads of semi-precious stones and shell. Period II is the classic Nal period, although apart from the polychrome 'Nal' ware, there were many types of ordinary domestic pottery as well. The dead were put in single graves with a few pots. Its mud-brick houses had small rooms provided with storage bins, numerous pots, grinding stones, stone and bone implements, terracotta bull figurines, and semi-precious stone beads. Period III (6 m thick cultural deposit) was found to have close connections with central and north Baluchistan and the sites of Mundigak in south Afghanistan and Shahr-i-Sokhta in southeastern Iran. There is no 'Nal' pottery, and in the large rooms with clay-plastered floors, gravel foundations and the use of wood in both the foundations and the roof, there were stone and bone implements, pottery, beads, terracotta figurines, and some copper seals. Copper and possibly silver were processed at the site where potters' kilns have also been found. Period IV, the last phase of occupation at the site, represented the Kulli-Harappa complex. Palaeobotanical and palaeozoological studies do not denote any basic climatic change, and for the desertion of the site, some local factors like the shifting of the water-courses may be responsible. The entire 13 m thick Nal sequence has been placed between 3800 and 2200 BC (calibrated).

In the Gomal plains of the Northwestern Frontier, excavations at Gandi Umar Khan have led to the establishment of the following sequence in the Gomal valley: aceramic Neolithic, ceramic Neolithic (*c*.4500–3500 BC), Tochi-Gomal phase (*c*.3000–2700 BC), the transitional phase to the Kot Dijian phase, the Kot Dijian phase, and (after an occupational break) the mature Harappan phase. An interesting aspect is that both the Kot Diji phase and the mature Harappan phase have been subdivided at this site into a number of sub-phases on the basis of the occurrence/non-occurrence of particular types of pottery. The radiocarbon chronology makes the Kot Diji phase of this region late in comparison with its date elsewhere, and one now notes a reluctance among some Pakistani archaeologists to accept Kot Diji as 'early Harappan'. However, the areas in which the Kot Diji-type of pottery have been traced are vast, and its cultural picture was not the same everywhere. The chronology also could vary significantly.

Among the sites of the Indus civilization, which have recently emerged into limelight, one may mention Kanmer, Shikarpur and Juni Karan in Gujarat, Bhirrana and Farmana in Haryana, and Sinoli and Alamgirpur in western UP.

Kanmer, near Rapar like Dholavira, is a fortified settlement with about 9.5 m high fortification wall and the evidence of rice, wheat, barley, and lentils. There are four cultural stages at the site, beginning with the early Harappan and ending with the post-Harappan. An interesting feature of the site is the find of a large number of microliths made of steatite. At the edge of a narrow creek of the Gulf of Kutch, Shikarpur is a 3.4 ha site located on the top of a sand dune. Of its 6.40 m thick occupational deposit, Phase 1 is mature Harappan, but Phase 2, although mature Harappan because of its typical pottery, Rorhi-type chert, shell bangles, stone beads, terracotta beads, bangles and triangular cakes, cart frames and wheels, and copper implements has regional pottery types. Phase 3, much eroded, occurs at the top. A fortification wall has been traced at an edge of the site. Juni Karan on the old Sind to Kutch route, located in the Khavada island of the Rann of Kutch, about 42 km to the northwest of Dholavira, is a fortified citadel complex within an outer fortification.[31] The outer fortified area (220 m x 225 m) had in its northern part a citadel area (72m x 92 m). The fortifications were made of rubble set in mud mortar. The gateway in the southwest was approached by a 3.4 m wide corridor which was originally 6.42 m wide. Further east along the fortification, another gateway had a set of large chambers and led to Stadium I (25 m x 8.25m ) which had at its eastern edge Stadium II (22.20 m x 14.50 m). Stadium I, basically a brick platform sloping away from the chambers of the gateway to the ground in front, has been supposed to be the common people's stadium, whereas Stadium II is supposed to have been meant for the elite. There is an open area of 200m x 50m between the stadia and the 'lower town'. Juni Karan partly duplicates the planning of Dhola Vira, but the finds of two stadia and the fact that it is located in another island of the Rann of Kutch make it a very important site.

Bhirrana (150 m x 220 m) in the Fatehabad sector of Haryana, where Banawali and Kunal are located, shows four phases: Hakra ware phase (IA), early Harappan(IB), transitional to mature Harappan or early mature Harappan (IIA), and mature Harappan(IIB). The occurrence of dwelling pits which were up 3.40 m in diameter, 34 cm to 58 cm deep, and mud-plastered with occasional brick-linings on the inside, recalls similar finds at Kunal. It has been assumed by the excavator that these dwelling pits without any trace of postholes around them could accommodate three to four persons and had in all likelihood superstructures of light material. There were also smaller pits (2 to 2.20 m diameter and 0.8 to 1.08 cm deep), some of which contained charred bovine remains with horns severed at the base, and grains. These have been inferred to be sacrificial pits. This occupational level is associated

with the Kalibangan type of early Harappan pottery and a bichrome pottery (outline in black with white inside). Graffiti were observed, although rarely, on the pottery. Two copper rods, shell and terracotta bangles, and beads of semi-precious stones were among the other finds from this phase. Phase 2 was more prosperous, showing a fortified and planned settlement with rectangular mud-brick houses and streets, dish-on-stands and button-based goblets as pottery shapes and a hoard of 3461 semi-precious stone beads including 248 specimens made of lapis lazuli. The mud fortification wall of the mature Harappan phase was 2.15 m to 3.75 m wide and was accompanied by multi-roomed mud brick houses with drainage, hearths or ovens, brick-laid bathroom floors and storage pits. A copper-smelting area has been identified outside the western fortification wall. Two streets, one along the fortification wall and the other in the central part of the settlement, have been excavated. The pottery is typically mature Harappan, and among the copper tools one notes Ganeshwar-type arrowheads and two inscribed celts. Spokes, similar to the ones at Banawali and Rakhigarhi, have been found painted on terracotta wheels. Gold beads, five steatite seals, an ithyphallic terracotta, a female terracotta figurine and the engraved figure of a woman recalling the pose of the famous 'dancing girl' of Mohenjodaro on a potsherd are among the other important finds.

Among the pottery from Bhirrana, one notes what has been called Hakra ware on the analogy of sites in Cholistan—and the occurrence of this type of pottery which in Cholistan pre-dates the early Harappan phase at some Haryana sites including Kunal, Rakhigarhi, and Bhirrana—poses a problem regarding the current idea of development of the Indus civilization in Haryana. What is interesting is that this pottery has been found in the recent excavations at Farmana, basically an early and mature Harappan settlement site with burials near Rohtak, and further east, at Alamgirpur where the Harappan occupational level has been found interlocked with the Painted Grey Ware level, thus repeating the Bhagawanpura evidence of Haryana in the upper Doab as well. The Hakra ware level has been inferred by its excavator, the late L.S.Rao, to date from the 4$^{th}$ millennium BC. Whether the Hakra ware found as far east as Farmana and Alamgirpur dates from the same period remains to be seen. Sinoli near Baghpat in Haryana and not far from the left bank of the Yamuna has revealed a large burial site where the burials have been found mostly extended. The copper objects found among the grave goods are bangles, antennae-swords, and anthropomorphs. The last two types are typical Gangetic valley 'Copper Hoard' specimens and their occurrence in a burial of the Harappan tradition at Sinoli clearly indicates that the Copper Hoard

assemblage was a part of the Harappan tradition. A copper sheath of an antennae-sword was also found. This is the first time that such a discovery has been made. The copper anthropomorphs have been found possibly in a ritual context. The finds comprise, in addition to the copper objects, semi-precious stone beads, micro-beads of steatite and a corpus of rich well-slipped plain and painted red pottery whose shapes include elongated, narrow-necked and footed vases with out-turned rims, and short and squat dish-on-stands. The date of Sinoli is uncertain but cannot be much different from the nearby excavated site of Hulas. Another major Harappan discovery in this area is that of a rich hoard of gold and silver jewellery and semi-precious stone beads at Mandi in the Muzaffarnagar district, which indicates that the upper Ganga plain or at least the northern part of the Doab had a prosperous Harappan phase which also incorporated the tradition of the Gangetic valley copper hoards.[32]

An isolated find from Kalibangan deserves special attention. A small terracotta *Sivalinga* has been located among the excavated mature Harappan antiquities from the site. The identification is indisputable and sets at rest a long-standing controversy about the presence of Siva worship in the Indus civilization.[33]

Some new insight has been obtained in recent years on the distribution of the Indus sites in Haryana, Indian Panjab, and western UP. First, in western UP the distribution of such sites is right up to the foothills of the Siwaliks. Painted pottery of this type has been found on the right bank of the Ganga in the shadow of the hills of Haridwar. Second, in Haryana, the broad trajectory of the Mature Harappan distribution is the alignment of Sirsa, Fatehabad, Hissar, Hansi, Bhiwani, Rohtak, and Jhajjar, with only one site—Balu—in the Jind-Kaithal stretch. This was the broad line of movement from Sirsa to the area of Delhi in the historical periods too, and here we can only observe this general similarity without trying to offer any specific explanation. At Badli, east-southeast of Jhajjar, R C Thakran[34] has excavated a Mature Harappan level, and the location of this site suggests a Mature Harappan thrust towards the Yamuna. In Indian Panjab, sites of the Harappan painted pottery tradition occur in the districts of Amritsar and Gurdaspur and suggest a similar distribution in the whole of Lahore-Gujranwala-Sialkot sector.

As far as we can judge, the occurrence of sites of the Harappan painted pottery tradition in the districts of Amritsar and Gurdaspur are important in their own right, indicating their occurrence in the Lahore-Gujranwala-Sialkot sector of Pakistani Panjab. The site of Manda south of Jammu, which belongs to this tradition, also suggests the occurrence of sites of the Harappan tradition in this part of Pakistan.

The find of painted pottery sites in the Hoshiarpur area—even Nawanshahr from where painted pottery and plain red pottery of thick fabric occur at Rahon—indicates that there was a chain of sites of the Harappan tradition at the foot of the Panjab Siwaliks. Rupar and other sites of the area, including Chandigarh, may be considered part of that zone in the Siwalik foothills and the submontane areas. The painted pottery sites of the Ferozepur district fall in a border area with Pakistan, and again, one can expect such sites south of Lahore. Ferozepur itself easily leads to Pakpattan on the Pakistani side. In fact, the location of Harappa, when viewed in the light of the route which came both from Sind and the Gomal plain to join the Sirsa to Rohtak alignment, clearly shows that it was a major site on this route.

The idea that there was a Harappan migration to the east in the late phase of this civilization has been propounded quite frequently. Even without going into the archaeological nitty-gritty of this idea, one can say that the sheer fact of Harappan distribution in a massive zone going across the riverine plain to the long Siwalik belt from Jammu to Haridwar, covering Panjab, Haryana and western UP considerably nullifies this idea of the Harappan sites being comparatively late in this region. The sheer geographical expanse of their distribution makes one realize that such a close adaptation to this landscape can only imply a deep root and long developmental process (for the details of this site distribution in Haryana and Indian Panjab.[35]

Finally, there is an increasing tendency to relate the growth and decline of the Indus civilization to the fluctuations of the monsoon.[36] Whether this type of environmental determinism offers a logical way to understand the phenomenon of the Indus civilization can always be debated.

## India beyond the Indus Civilization

New information is available from most of the areas, but much of it is only in bits and pieces. The date-range of the Gandhara Grave Culture in Chitral has been found to be from *c.*1000 BC to *c.* AD 1000, thus bringing this grave tradition down to the Islamic period.[37] In southeast Baluchistan, there is apparently a desertion of sites after the Kulli complex, which is inexplicable. The earliest radiocarbon dates from Balathal in southeast Rajasthan suggest its beginning well inside the 5th millennium BC and strongly reinforce my idea that there was an early and independent centre of agriculture and metallurgy in the Aravallis. Ojyana is a major newly excavated site in this region. It was a fortified settlement of the Ahar culture and has yielded evidence of streets and regular planning of houses. A diversified range of food-crops included

wheat, barley, rice, jowar, ragi, and Setaria millets, a variety of legumes, sesamum, and safflower. There is no radiocarbon date from the site. Gilund was excavated in 1999–2004 but did not yield anything novel except a complex with parallel walls. In fact, sites have been dug all over India up to the deep south, but only very few of them are important.[38] In the deep south Adichchanallur on the bank of the Tamraparni in Tirunelveli is one such site. Claims have been made for a separate habitational area in this large urn-burial site where three phases of burials have been established. The area was used for copper and iron-ore mining before it was used as a burial place. The burial urns of Phase 1 were buried cutting the bedrock and the bodies were placed in the crouching position along with couex beads and iron dagger, sword and knife. There were two more phases of burials after that. There are two Optically Stimulated Luminiscence (OSL) dates from the site: 1570 BC (plus/minus 570 years) and 3750 BC (plus/minus1200 BC). The dates permit a wide range of variation, but the beginning of the site may securely be placed in the second millennium BC.[39] Major discoveries regarding the beginning of iron have been made at Malhar (near Banaras) and Dadupur (near Lucknow) in UP. At Dadupur the earliest date, *c*.1700 BC, is estimated on the basis of three separate radiocarbon dates, whereas at Malhar the calibrated ranges of the two available dates are 1882–1639 BC and 2012–1742 BC. The Malhar finds include an iron ploughshare, thus proving that iron began to be used in agriculture, at least in the Banaras part of the Ganga plain, by the beginning of the second millennium BC.[40]

## Early History

The date of *c*.800 BC has emerged for the earliest phase of the Northern Black Polished Ware (NBP) at several sites including Ayodhya, Jhusi, and Gotihawa. I would now put the first phase of the beginning of cities in the subcontinent between *c*.800 and *c*.500 BC .There is no reason to think that the spread of the NBP to the areas outside the Ganga plain was significantly later than the date of its beginning in the former area. For instance, the Ganga plain and the Deccan were well-linked by a complex of routes, which eventually led to the deep south. The NBP-bearing level of Wari Bateshwar in the Brahmaputra-Meghna delta has been dated in the 5th century BC, and from Korkai near Tirunelveli there is a date of *c*.9th century BC for the NBP. At Alagankulam near Madurai the NBP has been found in the early context of the site, and the quality of this NBP is as good as the quality of the early NBP from the Gangetic valley. Once one accepts the argument that the NBP could easily reach the

areas beyond the Ganga plain on the back of the age-old trade between the Ganga plain and these areas, we have to revise the generally late dates which have so far been inferred for the beginning of the early historic period in Andhra and the southern states of Karnataka, Tamilnadu, and Kerala. Pending further research, I would put the date of the early historic beginning in each of these areas around 500 BC.

A major early historic discovery of the recent years is the identification of Muziris, mentioned in the Roman sources, with Pattinam near Kodungallur (north of Cochin) on the coast of Kerala. Occupation began at the site in the first half of the first millennium BC and the height of the trading period was from the 1st century BC to the AD 5th century. The site has a rich repertoire of imported West Asiatic and Roman pottery, and yielded a 'wharf'.[41]

The trade network of the early historic period has been highlighted by a field-study of the routes which went from the Ganga plain to the Deccan. In the Ganga plain, the starting points were Pataliputra, Banaras, Allahabad, Kausambi, Kanpur, Mathura, and Agra. It was a complex of routes in which various areas of central India (Rewa, Malwa, the Jabalpur area, Hosangabad, Shadol-Bandhogarh, Burhanpur, Chhattisgarh, etc.) played a leading role in the sense that the routes to Maharashtra and Andhra went through them.[42] One hopes that the grassroots study of such routes will throw a lot of light on the network of communications which linked the various parts of the early historic sub-continent. Many of these routes continued to be in use till the modern period.

## Notes

1. Chakrabarti 2003, Singh 2004, Guha-Thakurta 2004, Lahiri 2005, Ray 2007, Pappu 2008.
2. Chakrabarti 2008a, 2008b.
3. Chakrabarti 2005.
4. Kivisild *et al.*, 2000.
5. Sahoo *et al.*, 2006.
6. Personal information from Professor S R Walimbe.
7. Sankhayan 2005.
8. Sonakia and Biswas 1998.
9. Patnaik *et al.*, 2009, Chauhan and Patnaik 2008, Mulagapalli, Patnaik, and Verma 2007.
10. Mulagapalli, Patnaik, and Verma 2007.
11. Patnaik *et al.*, 2009.

12. Patnaik and Chauhan 2008.
13. Agrawal and Kharakwal 2002.
14. Kumaravel *et al.*, 2005.
15. Acharya 2003.
16. Paddayya *et al.*, 2002.
17. Petraglia, Shipton, and Paddayya 2005.
18. Personal information from D K Medhi.
19. Chakrabarti 2006: 60–1.
20. Gunnell *et al.*, 2006.
21. Petraglia *et al.*, 2007.
22. Field, Petraglia, and Lahr 2007.
23. Tewari *et al.*, 2002.
24. Ali and Rahman 2005.
25. Chakrabarti 2006: 97;Clarkson *et al.*, 2009.
26. Sonawane 2008.
27. Yadava *et al.*, 2007.
28. For the details of Lohuradeva, Tewari *et al.*, 2003.
29. For the details, Chakrabarti 2006.
30. Jan 2008.
31. Pramanik 2003–04.
32. Tewari 2004, for Mandi; for the rest, Chakrabarti 2006, Rao 2005–06.
33. Bala 2004.
34. Personal information in April 2008
35. Chakrabarti and Saini, in press.
36. Gupta *et al.*, 2006.
37. Ali *et al.*, 2008.
38. For these sites and the ones mentioned here, Chakrabarti 2006.
39. Satyamurthy 2007.
40. Tewari 2003.
41. Cherian, Selvakumar, and Shajan 2007.
42. Chakrabarti 2005, for the details.

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# Notes

## Chapter 1

1. Raychaudhuri, 1996, p. 1.
2. Sastri, 1935, p. 16.
3. The study of the socio-politics of the past is a component of the archaeology syllabi of a number of British universities, including Cambridge. The literature is ever-growing and relentless in exposing how much of the current interpretative structure of the ancient past has been influenced by various vested interests. This archaeological literature is separate from the literature generated by Edward Said's classic treatise on Orientalism (Said, 1978) in the sense that it is much more oriented towards examination of specific issues. This began in the mid-1980s, with Trigger, 1984, Bernal, 1985 and Lowenthal, 1985 being three of the classic expositions of that period. It gained in strength after the holding of the first World Archaeological Congress in Southampton in 1986 (cf. Gathercole and Lowenthal 1990) and the relationship between archaeology and politics was the theme of a special issue of the *Archaeological Review* from Cambridge in 1986. Among the more recent publications one may mention Chakrabarti, 1997 in the Indian context and Whitelam, 1996 in the Israeli context, and for a more eclectic spread, Kohl and Fawcett, 1997, Graves-Brown, Jones and Gamble 1996, and Ucko, 1995 are representative.
4. Chakrabarti, 1997, pp. 207–8.
5. This section is based on Chakrabarti 1988a which refers to the earlier publications on the theme. There have been two biographies since then, one of Aurel Stein (Walker, 1995) and the other of Charles Masson (Whitteridge, 1986; also Possehl, 1990). A.C.L. Carlleyle's collections in the museums in Britain led to a monograph with some biographical notes by Cook and Martingell, 1994. For John Marshall, Lahiri, 1997, for the beginning of a full-length study of Marshall on the basis of archival material. The history of the archaeology departments of 'native' states, such as those of Hyderabad, Bhopal, Kashmir, Baroda and Gwalior, remains unresearched. Another area which calls for detailed research is the emergence of a consciousness of the Indian past in the regional literature of different parts of the subcontinent.

6. Allchin and Chakrabarti, 1979, p. 69.
7. Ibid., p. 28.
8. Lahiri, 1997, p. 134.
9. For a study of the basic geography of the subcontinent in all its majesty, O.H.K. Spate,1957 (2nd edn; the subsequent editions are with the co-authorship of A.T.A.L earmonth) is still unsurpassed. This can be followed up by monographs like R.L. Singh, 1971. Schwartzberg, 1992 provides an excellent historical atlas but without any significant archaeological component. On regional levels the monographs which have been published by the National Book Trust of India are useful, but on the whole we should not lose sight of that great repository of basic geographical information on India, the 'District Gazetteers.'
10. The chapter on history in Spate, 1957; Subbarao, 1958; the chapter on geographical approaches in Chakrabarti, 1988b; Richards, 1933; Paddayya, 1994. Sankalia 1949 is a very fine example of working out ancient historical geography on the basis of inscriptions (in this case, of Gujarat) and generated more studies along this line. Holdich, 1910 provides a masterly geopolitical study of the north-western frontier.
11. Subbarao, 1958, chs 6, 7, 8.
12. Singh, 1992, pp. 28–9
13. Bose, 1961, introduction.
14. Ibid.
15. This section is based mostly on Cole, 1963.
16. Montague, 1964, p. 6.
17. P.P. Majumdar et al., 1990.
18. cf. reference to Aryan ethnicity and ideology in Allchin, 1995, p. 51.
19. Cust, 1887, p. 61.
20. For a summary of Risley's scheme, Risley, 1903.
21. For Guha-Hutton scheme, Hutton, 1933.
22. For a summary of Grierson's scheme, Grierson, 1909. Chakrabarti, 1997, pp. 86–151 provides a detailed critique of the interplay of race, language and culture in the study of Indian history.

## CHAPTER 2

1. de Terra and Paterson, 1939.
2. Burkitt and Cammiade, 1930.
3. Krishnaswami, 1947, for a review of this period with full references.
4. Sankalia, 1963 provides the details of the literature of this period.
5. Sankalia, 1971.
6. R.V. Joshi, et al., 1974.
7. References which are relevant to this section will appear in the appropriate places below.
8. Sonakia, 1984, 1985; Kennedy, 1992; Kennedy et al., 1991; Badam et al., 1986; Badam and Sathe, 1995
9. The source of references to China and Java is Conroy, 1997 (for the Java dates, p. 300; for the Longgupo finds, pp. 317–19); for the work done in the Indian

Siwaliks and Ladakh, Verma, 1975, Verma and Srivastava, 1984, 1991; Tripathi et al., 1988; J.C. Sharma, 1977; Ranga Rao et al., 1988; on the Pakistani side, the most detailed work is: Rendell et al., 1989; but also, Rendell, 1984. On Bori, Korisettar et al., 1989; S. Mishra et al., 1995; Acharyya and Basu, 1993; Shane et al., 1995. Acharyya and Basu (1993) first suggested that the Bori tephra belonged to the Youngest Toba Tuff. This conclusion has been supported on the basis of more detailed geochemical evidence by Shane et al., 1995. It should be clear to anybody familiar with the literature concerned that since 1975 the geologists of the Geological Survey of India, especially B.C. Verma, C. Tripathi and others, have been claiming the Lower Pleistocene association for some artefacts they found in the Siwaliks and Ladakh. In this sense the discovery made by Rendell and others in the Potwar plateau took place later than the one made in the Indian Siwaliks. Although the archaeologists of the Deccan College, Pune, regularly cite the British work in the Potwar plateau, till now they have continued to show remarkable indifference to the earlier work of the Geological Survey of India. In none of the articles on palaeolithic India in the recent issues of *Man and Environment* have I come across any reference to the significance of Verma's and others' work or any reference to A. Ranga Rao's dating of Uttarbaini.

10. Williams and Clarke, 1995, p. 284.
11. Ghosh, 1973.
12. Sankalia, 1974.
13. Rendell et al., 1989, p. 28.
14. Somayajulu, 1990.
15. Agrawal, 1992, p. 98.
16. In addition to Rendell, 1984 and Rendell, et al., 1989 mentioned earlier, the recent work in the Potwar (the correct version is 'Potohar' but 'Potwar' has long been in use) plateau is accessed through the following publications: Dennell, et al., 1988; Rendell and Dennell, 1985; Dennell, 1989; Dennell et al., 1990; Dennell, 1991; Dennell and Rendell, 1991; Dennell et al., 1993. For the Sanghao cave, Dani, 1964, Allchin and Allchin, 1968, pp. 71–4; Ranere, 1982; Tusa, 1986. For Sind, B. Allchin, 1976; Biagi and Cremaschi, 1988.
17. For the Kashmir upper palaeolithic, R.K. Pant et al., 1982; for Jammu, Mohapatra, 1974; for Kangra, Lal, 1956; also, the relevant section in Sankalia, 1974.
18. For work in the Berach and Luni basins, Misra, 1967; for work in the Ajmer, Luni valley and Jaisalmer sectors, B. Allchin et al., 1978; for work in the Jayal, Didwana, Singi Talav, etc. sectors, Misra et al., 1980; Misra, et al., 1982; Misra, 1995; Raghavan et al., 1989; Gaillard et al., 1986; for work in the Aravalli sector near Delhi, Chakrabarti and Lahiri, 1987.
19. For Gujarat as a whole, the best introduction is still Sankalia, 1974; also, the articles on Gujarat in *QEGI*, pp. 246–81; Marathe, 1981; Baskaran et al., 1986.
20. Some of the important references in the context of Madhya Pradesh are: de Terra and Paterson, 1939; Sankalia, 1974; Sen and Ghosh, 1963; Khatri, 1961; Misra, 1985; Mishra and Rajaguru, 1993; Misra et al., 1990; Joshi, 1961; Badam,

1982; Clark and Williams, 1990; Jacobson, 1985; Sharma and Clark, 1983; Kenoyer et al., 1983; Supekar, 1985; Ahmad, 1984; Armand, 1983; Pandey, 1987.

21. On Maharashtra Sankalia, 1974 is still a major source and may be supplemented by the following: Guzder, 1980; Corvinus, 1967, 1981–83; Mishra, 1995; Goudeller and Korisettar, 1993; Rajaguru and Korisettar, 1987; R.S. Pappu, 1995; Sali, 1989; Joshi and Bopardikar, 1972.

22. Korisettar et al., 1993, p. 13. On Karnataka in general: Joshi, 1955; R.S. Pappu, 1974; R.S. Pappu and S. Deo, 1994; Paddayya, 1982; Paddayya and Petraglia, 1995; Kale et al., 1986.

23. On Kerala, Rajendran, 1989; but comments in Marathe, 1995, p. 406.

24. On Tamil Nadu, in addition to Krishnaswamy, 1947, and Sankalia, 1974, S. Pappu, 1996.

25. On Andhra, in addition to Sankalia, 1974, Murty, 1968, 1974; Raju, 1988; K.T. Reddy, 1994.

26. For Orissa, Bose and Sen, 1948; Mohapatra, 1962; for a review of more recent publications, Basa,1994.

27. For a review of the literature and data on West Bengal, Chakrabarti, 1993, 1998.

28. For the Chhotanagpur plateau section of Bihar, Narayan, 1996; Chakrabarti, 1993; A.K.Ghosh, 1970; for the Kharagpur hills near Munger, Pant and Jayasawal, 1991.

29. P.C. Pant, 1982; G.R. Sharma, 1973; Williams and Clarke, 1995; Krishnaswami and Soundara Rajan, 1951.

30. For a critical review of the north-eastern evidence, Chakrabarti, 1998, pp. 1–18; also, Chakrabarti, 1992, ch. 2.

31. Corvinus, 1995.

32. The literature and the evidence are well surveyed in S. Mishra, 1995; also, Kshirsagar, 1993.

33. Misra, 1989, p. 20.

34. Paddayya, 1982, p. 20.

35. For Paisra, Pant and Jayasawal, 1991, p. 48.

36. Misra, 1985, pp. 37–9.

37. Kenoyer et al., 1983.

38. For 'site 55', Rendell, Dennell and Halim, 1989; for Andhra, Raju, 1988.

39. Murty, 1985.

40. Vishnu-Mittre, 1989.

41. Bednarik, 1993 provides the most comprehensive discussion, with references.

## Chapter 3

1. For Patne, Sali, 1989.
2. For the *teri* sites, Gardner, 1995; Soundara Rajan, 1989.
3. Williams and Clarke, 1995.
4. K. Thomas, 1997.
5. Cook and Martingell, 1994, p. 11.

6. For Birbhanpur, Lal, 1958; for Paruldanga, Chakrabarti, 1993, p. 178.
7. Meher-Homji, 1980; Singh et al., 1974.
8. Singh, Wasson and Agrawal, 1990.
9. Nigam and Hashimi, 1995; Caratini et al., 1994.
10. Possehl, 1994.
11. For Bagor, Misra, 1973; for Adamgarh, Joshi, 1989; for Baghor II, Sharma and Clark, 1983; for Sarai Nahar Rai, G.R. Sharma, 1973; for Mahadaha and Chopani Mando, G.R. Sharma et al., 1980; for Damdama, R.K. Varma et al., 1985; Pal, 1992, 1994; Kajale, 1990. For a review of the Ganga valley mesolithic, U.C. Chattopadhyay, 1996. Two volumes on skeletal remains are important: Kennedy, Lovell and Burrow, 1986; Kennedy et al., 1992. For Paisra, Pant and Jayaswal, 1991, ch. 7. For surveys of Mesolithic remains in particular areas, R.K. Varma, 1986; Cooper, 1998. For the 'heavy duty component' of the mesolithic, Ota, 1986.
12. V. Smith, 1906.
13. Jacobson, 1980.
14. Mathpal, 1984.
15. On rock-art in general in India, Neumayer, 1983, 1993; Brook and Wakankar, 1976.

## CHAPTER 4

1. Jarrige and Meadow, 1980; Jarrige and Lechevallier, 1979; Jarrige, 1981; Meadow, 1981, 1996; Constantini, 1984; Lechevallier, 1984; Lechevallier and Quivron, 1985; Samzun and Sellier, 1985; Lukacs, 1985; Thibault, 1989, 1992; Sellier, 1992; Saizieu and Bouquillon, 1994.
2. Sellier, 1992.
3. Fairservis, 1956.
4. Ross, 1946, Fairservis, 1959.
5. de Cardi, 1965.
6. Hargreaves, 1929.
7. Possehl, 1986; Casal, 1966; for Edith Shahr complex, Fairservis, 1971; Stein, 1929.
8.. Dales, 1979.
9. Besenval, 1994; Stein, 1931.
10. Allchin and Knox, 1981; Allchin et al., 1986; Khan, Knox and Thomas, 1991.
11. Dani, 1970–71; Durrani, 1988; Durrani, Ali and Erdosy, 1991; T. Ali, 1994; Asthana, 1985.
12. Flam, 1993; Casal, 1964.
13. Halim, 1970–71, 1972.
14. Mughal, 1974, 1990; F.A. Khan, 1965.
15. Dales, 1992.
16. Lal, 1979.
17. Khatri and Acharya, 1994–95.
18. Bisht, 1982, 1987.
19. P.L. Chakravarty and V. Kumar, 1993.

20. Bisht, 1997.
21. Chakrabarti, 1995.

## CHAPTER 5

1. Discussion in Chakrabarti, 1995, pp. 106–11; for north Afghanistan, Francfort, 1989; for Baluchistan, the two monographs by Stein (1929, 1931) and specifically for the Bolan pass area, Jarrige, 1989; for the Makran coast, Dales, 1962; Besenval, 1994; for the Son Miani Bay, Dales, 1979; for the Gomal valley, Dani, 1970–1; for Sind, the basic report is still Majumdar, 1934 to be supplemented by Flam, 1986; for Cholistan, Mughal, 1992, 1997; for the Punjab plains in Pakistan, Mughal, 1997; also, Fentress, 1982; for the Indo-Gangetic divide, the distribution maps and site-lists in Joshi, Bala and Ram, 1984; for Gujarat, Rao, 1991 (only the Gujarat section).

2. Cited in Chakrabarti, 1995, pp. 87–8.

3. Cited in ibid., 1995, p. 51.

4. Cited in ibid., 1995, pp. 49–50.

5. Cheesman, 1997, pp. 25ff; for the discussion on the preindustrial canal system, pp. 19–29.

6. Mohenjodaro: Bukhari, 1995; Marshall, 1931; Mackay, 1938; Dales, 1965; Dales and Kenoyer, 1986; Jansen, 1987; for Wheeler's work: Wheeler, 1968 (in specific for the result of 1922–27 work, Marshall 1931; for the result of 1927–31 work, Mackay 1938; for 1920–21 work, Banerji cited in Marshall); for Chanhudaro: Mackay, 1943; for Harappa: Vats, 1940; Wheeler, 1947; Kenoyer, 1992; for Kalibangan: Lal, 1979; for Banawali: Bisht, 1982, 1987; for Lothal: Rao, 1979; for Surkotada: Joshi, 1990; for Dholavira: Bisht, 1991, 1996, 1997; for Kuntasi: Dhavalikar, Raval and Chitalwala, 1996. For a general discussion, Chakrabarti, 1995, ch. 3.

7. On scripts, Possehl, 1996a is a comprehensive introduction; for a corpus of the sources, Joshi and Parpola, 1987; Mustafa and Parpola, 1991; also, Mahadevan, 1977. On pottery, an easy and clear introduction to morphology, Nigam, 1979; as an example of scientific study, Krishnan, 1992; for kilns and other issues, excavation reports. For lithics, Kenoyer, 1984; Biagi et al., 1995; Negrino and Starnini, 1995. For metallurgy, Lahiri, 1995; Chakrabarti and Lahiri, 1996. On beads, Mackay, 1937; B. Allchin, 1979; Kenoyer, Vidale and Bhan, 1991. For steatite micro-beads, Hegde, Karanth and Sychanthavong, 1982; on gold jewellery, Nanda, 1992, pp. 24–36; on the 'stone ware bangles', Halim and Vidale, 1984; for a general discussion, Kenoyer, 1998, ch. 8; also, Kenoyer, 1997. For shell-working, Hegde et al., 1990. Also, some relevant essays in Meadow, 1991.

8. Hemmy in Mackay, 1938; also, Mainkar, 1984.

9. Vij, 1984, p. 124.

10. For animal use, a convenient analysis with sources, Sahu, 1988, ch. 7; for crop lists, no comprehensive analysis is available, but among the good introductions are Vishnu-Mittre and Savithri, 1982 and K.S. Saraswat's analysis of the Rohira, Mahorana, Sanghol and Hulas material, cf. *Indian Archaeology—A Review*,

*1983–84* onwards. For the presence of dried fish from the Arabian Sea coast at Harappa, Belcher, 1994. For shells and molluscs, Deshpande-Mukherjee, 1998.

11. On internal trade, Lahiri, 1992, ch. 3 (the quotation from p. 142); on the external trade, Chakrabarti, 1990; for a somewhat different point of view, Possehl, 1996b.

12. The best discussion is still that by Marshall in Marshall, 1931.

13. Marshall, 1931 is still the best source, supplemented by Allchin, 1992; for a specimen from Dholavira, Chengappa, 1998.

14. Dutta, 1984, pp. 63ff; also, Hemphill, Lukacs and Kennedy, 1991.

15. For chronology, Chakrabarti, 1995, pp. 111–15.

16. Chakrabarti, 1995, p. 123; also, Ratnagar, 1991.

17. Ibid., pp. 129–40, for a review with sources.

18. Mackay, 1938, p. 6.

19. Kenoyer, 1993, p. 187.

20. Shaffer, 1986, p. 223.

21. Chakrabarti, 1995, p. 140.

## CHAPTER 6

1. For Koldihawa, A.Ghosh, 1989, vol. 1, pp. 232–3; for Kunjhun, *Indian Archaeology—A Review, 1981–82,* pp. 43–4.

2. For Pachrukhi, unpublished Ph.D dissertation (Cambridge University, 1987–88) by Ajay Pratap; discussed in Chakrabarti, 1993, pp. 111–12; for Kuchai, *Indian Archaeology—A Review,* 1961–62, p. 36; comments in Chakrabarti, 1993, p. 201.

3. The Ghaligai sequence in Stacul, 1969; the starting points of the literature on the Gandhara Grave Culture are Dani, 1967, Antonini and Stacul, 1972 and the corpus of articles published in *East and West* since the 1960s; cf. Stacul, 1993, 1995.

4. For Gufkral, *Indian Archaeology—A Review,* 1980–81; for Burzahom, Kaw, 1979; for Ladakh, Ota, 1993; for Almorah, Agrawal et al., 1995.

5. For Ganeshwar, in addition to *Indian Archaeology—A Review,* 1987–88, pp. 101–02, Agrawala and Kumar, 1982; comments in Chakrabarti and Lahiri, 1996, pp. 193–4. For Ahar, Sankalia et al., 1969; for Balathal, Misra, 1997; Misra et al., 1995 and the series of articles in *Man and Environment*, 21 (1), 1996, pp. 91–116. However, the premise that Balathal was a pottery trading centre is far-fetched. For an excellent analysis of the Ahar culture, Hooja, 1988.

6. Ansari and Dhavalikar, 1975; Sankalia et al., 1958, 1971; Wakankar, 1982; Banerjee, 1986; Lahiri, 1992, 161–70.

7. The two primary excavation reports in the context of Maharashtra are Sali, 1986 and Dhavalikar, Sankalia and Ansari, 1988. There is a plethora of reports and writings on the Maharashtra sites, among which Sankalia et al., 1960 on Nevasa certainly deserves notice. Also, Lahiri, 1992, pp. 171–81; Dhavalikar, 1988 provides the best general introduction. On Tuljapur Garhi, *Indian Archaeology—A Review,* 1984–85, pp. 48–50 and on Bhawar, *Indian Archaeology—A Review,* 1992–93, pp. 55–62. On the Vidarbha megaliths, cf. Deo, 1970, 1973.

8. Among the representative writings on this zone, an excerpt from Foote's

writing, Allchin and Chakrabarti, 1979, pp. 82–6; Wheeler, 1948; F.R. Allchin, 1960, 1961, 1963; Paddayya, 1973; Paddayya et al., 1995; Devaraj et al. 1995; Mujumdar and Rajaguru, 1966; Rami Reddi, 1978; M.S.N.Rao, 1971, M.S.N. Rao and Malhotra, 1965; M.S.N. Rao and Nagaraju, 1974; Thapar, 1957. On the painted pottery tradition of Andhra, the main excavated site is Ramapuram, cf. *Indian Archaeology—A Review,* 1981–82, 1982–83. The best introduction to the south Indian megalithic tradition is U.S. Moorti, 1984.

9. On Golbai Sasan, the most important excavated neolithic–chalcolithic site to date is Orissa, *Indian Archaeology—A Review,* 1991–92, pp. 86–7. For the north-eastern region, Sankalia, 1974, pp. 283ff. (as an introduction to the literature); comments in Chakrabarti, 1998. On West Bengal, Chakrabarti et al. 1993 for black-and-red ware sites; also, *Pratna Samiksha* (Directorate of Archaeology and Museums, Govt. of West Bengal), nos. 2 and 3. On Bihar, B.P. Singh, 1990; Varma, 1971; A.K. Prasad, 1990.

10. On eastern Uttar Pradesh, P. Singh, 1994 is a work of pioneering significance, followed by work at other sites (cf. Imlidih, P. Singh, 1992–93, 1993–94) For work at Raja-Nal-ka-Tila, Tewari and Srivastava, 1996–97. On western Uttar Pradesh, Gaur, 1983, 1995 and Sahi, 1993 update all that was written earlier. Also, V.Tripathi, 1976 and M. Lal, 1984. For Bhagawanpura, Joshi, 1993; on the Harappans in the Ganga plain, Dikshit, 1984. On the 'copper hoards', Chakrabarti and Lahiri, 1996, pp. 77–90; Yule, 1985. On iron, Chakrabarti, 1992; Chakrabarti and Lahiri, 1994.

11. Chakrabarti and Lahiri, 1996, pp. 84–5.

12. Joshi, 1993, p. 8.

## CHAPTER 7

1. The beginning of writing in India has been well discussed from the Indian point of view by R.B. Pandey, 1952; for the opinions of D.C. Sircar and A.H. Dani, D.C. Sircar, 1965; Dani, 1963; for the Anuradhapura evidence, Coningham and Allchin, 1995, pp. 176–9; for our position on the date of the Buddha, Chakrabarti, 1997, pp. 183–8; for A.K. Narain's clinching argument, Narain, 1993; for the early date of the NBP at Sringaverapura—*c.* 750 BC, according to the Thermoluminescent datings by A.K. Singhvi—Agrawal and Yadav, 1995, pp. 116–17; for Marshall's opinion on the date of the NBP at Bhita, Marshall, 1911–12.

2. For discussions on the *Purana* texts, Rocher, 1986; Hazra, 1987 (original edition in 1940); the discussion on political history is based on Raychaudhuri, 1996; for a generalized account of economic history of the 'Buddhist period', Rhys Davids, 1901; for a recent perspective on India's Roman and south-east Asiatic trade, Ray and Salles, 1996, Cimino, 1994.

3. This section is based on Chakrabarti, 1995, ch. 5, which contains the necessary references. The section on the Kaveri delta is based on Rajan, 1997 and also on the basis of an unpublished paper prepared by him on 'early historic archaeology of Tamil Nadu.' For south India in general, Champakalakshmi, 1996. Further, a few new and important reports: Howell, 1995; V. Begley et al., 1996; Soundara Rajan, 1994; K.M. Srivastava, 1996.

4. For the distribution and types of Asokan inscriptions, Allchin and Norman, 1985. Since then there have been two other finds: fragment of Pillar Edict 6 from Buner or the area of Takht-i-Bahi in the NWFP, and fragments of Rock Edict 12 and Rock Edict 14 and a separate 'Kalinga edict' replacing Rock Edict 13 from Sannati in Gulbarga district, Andhra Pradesh; cf. Norman, 1988, 1991. Specific mention should be made of the usefulness of Hultzsch, 1925. For the immediately post-Mauryan inscriptions, Luders, 1963 serves as a good introduction.

5. For the inscriptions of the early centuries AD, the examples which have been used here are Kielhorn, 1905–6 and Senart, 1905–6. For early Tamil-Brahmi inscriptions, Mahalingam, 1967 provides a starting point. A very important addition to the corpus of Kushana inscriptions is Sims–Williams and Cribb, 1995–96. For the Kushana inscription mentioned in our text, Sircar, 1965.

6. P.L. Gupta, 1969, pp. 9–11; for a more recent attempt, Rajgor 1998.

7. P.L. Gupta, 1969, pp. 16–17.

8. Rajan, n.d. A clearly written and useful introduction to the literature on -ancient Indian coinage is Goyal, 1995. The primary source is 'catalogues' of various collections; cf. Allan, 1936. As examples of modern studies one may mention A. Jha, 1991; P.L. Gupta and A. Jha, 1987; Bopearachchi and A. Rahman, 1995.

9. The most detailed discussion on the Mauryan sculptural tradition is by Gupta, 1979. On Bharhut, Bodh Gaya, Sanchi, the original reports of Cunningham, 1879, 1892 and Marshall and Foucher 1983 (reprint). On Amaravati, Knox, 1992 and Sivaramamurti, 1942. On the west Indian rock-cut caves, Fergusson and Burgess, 1880, and for the Bhuvaneshwar caves, Ghosh, 1974, pp. 73–84. On Gandhara, Zwalf, 1996; Swati, 1997. On Mathura, R.C. Sharma, 1984; Asthana, 1990. For a summary of the Indian textual evidence on painting, Sivaramamurti, 1970, pp. 1–21; for Sunga period paintings on mica sheets, V. Mishra, 1961; for Ajanta, A.Ghosh, 1967 and for Bagh caves, Marshall et al., 1927. The best general introduction to Indian art is by A.K. Coomaraswamy, 1965 (reprint).

10. On early Buddhist architecture, Sarkar, 1966 and D. Mitra 1971; for a historical overview, Chakrabarti, 1995. On temples, K. Deva, 1995.

## CHAPTER 8

1. Basak, 1997.
2. Chakrabarti et al., 1996.
3. Chakrabarti et al., 1995.
4. Kumar, 1988.
5. Mehra and Arora, 1985. In the same context, Vishnu-Mittre, 1985.
6. For some relevant early notices of preindustrial mining, Allchin and Chakrabarti, 1997, pp. 465–81.
7. Craddock, 1997, p. 117.
8. Chakrabarti and Lahiri, 1996, p. 201.
9. Srinivasan and Glover, 1997.
10. Mac Dowall, 1994.

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This book presents archaeological history from the palaeolithic beginnings to c. AD 300, when early historic India assumed its basic form. It lucidly reconstructs the historical developments of human–natural resource interaction in the subcontinent using maps, illustrations, and tables. The second edition updates the research to include new ideas and discoveries—of tools from the Palaeolithic and Mesolithic ages and human fossil finds—in Indian archaeology between 1998 and 2008. This comprehensive and up-to-date book will be an essential reading for students and teachers of archaeology and ancient Indian history.

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